NEW-YORK FARMER,

AND

AMERICAN GARDENER'S MAGAZINE.

VOL. X.] PUBLISHED MONTHLY, AT 132 NASSAU-ST., AT THREE DOLLARS A-YEAR, IN ADVANCE. [No. 3.

D. K. MINOR, and GEO. C. SCHAEFFER, } Editors and Proprietors.

FOR MARCH, 1837.

NEW SERIES—VOL. V.

LIFE IN ILLINOISE; AGRICULTURE, &c.—The following communication of E. R W., contains information not only interesting, but highly important, to thousands of our citizens who are struggling with adversity and want. It points out a path by which the man of small means and entire dependance may become, in a good degree, *independant*, with a farm, house, and fields of grain of his own.

It would be no less surprising to us, than it is to our correspondent, that so few of our citizens of small means avail themselves of the advantages of the fertile West, if we were not aware of the lack of correct information possessed by them, of the best mode of getting there, and then of living until they can *prepare* to live. There is, in truth, very little known here, of the *detail* of the process of becoming *farmers* in a new country—and it is of course viewed as a herculean task. This difficulty, however, might be easily obviated, if some intelligent western farmer, who has formerly been a resident of this city, and therefore familiar with our mode of living, would publish a small work, showing the condition, prospects, and advantages of the country, together with judicious directions how to remove a family in the most comfortable and economical manner; advising what necessaries of life ought to be carried, and what can be obtained there to advantage,—and pointing out the best manner of commencing operations when there.

Such a work, by a judicious hand, could not fail to be highly useful; and we doubt not our correspondent, E. R. W., is a suitable person to prepare it. If he will do so, we will give it all the publicity in our power.

We shall at least hold him to his *intimation* at the close of his communication; hope soon to hear from him again.

For the New-York Farmer.

SPRINGFIELD, Sangamon Co., Ill.

MESSRS. EDITORS,—Having had some opportunity, from travel and residence in this country for a year or two past, to become a little acquainted with the state of things in these Western regions, I thought I would add to my business concern a few observations for your paper. They may be of some service to those, whom high prices and hard time at the East have induced to think of other countries, where labor is more abundant and better compensated.

It has often struck me as somewhat a matter of astonishment, that among the multitudes who earn a scanty and precarious living by their labor in the eastern cities, so few of them can make up their minds to remove to these countries, where, with no greater exertions, they could soon acquire every necessary comfort and convenience of life. Does the mere facts of our having been born and brought up in the city of New-York, and formed local attachments there, opperate so powerfully that we would rather remain there in poverty and want, than to live in another State in plenty and comfort? Let me take the case of a very numerous class in the eastern cities, those females who sew for their living. There are some few of this class who receive an adequate compensation for their labor, but the number of such is small. The great majority of them do not receive more than half enough to support them comfortably. The case of widows with small children is particularly hard. Out of the miserable pittance they receive for their labor, the best they can do is to protract a joyless existence, half fed, and half clothed—their children stunted in body for want of proper and sufficient food, and degraded in mind through want of that mental and moral training which it is impossible for the parent to provide. How is it possible for those who receive from 12½ to 25 cents for making a shirt, vest, or pants., even of the commonest kind, to maintain themselves decently, much less support and educate two or three children. Even if they received 50 cents for making such articles, (which, however, is more than hundreds of them do receive,) it would be totally inadequate for their wants, under the present prices of things. In this country, things are very different. There is, throughout the whole country, a want of laborers, in almost every branch of business. And, of course, wages are high. Those seamstresses, for instance, who cannot procure enough work at 50 cents at the east, would here have the same kind of work *urged* on them, at most seasons of the year, for 75 cents to $1 00.

There is another branch of business in which many females might find profitable employment in this country, that is, as domestics in private families. The domestic here is not exactly the same as at the east. She is not a *servant* girl—she is the *help* of the housekeeper. It is not by any means a disreputable employment. Such persons readily command from $1 50 cts. to $2 a week: in public houses something more. Most kinds of journeymen's work are done by the piece in this country, and the prices are high enough to enable a good active hand, in almost *any* business, to earn from 10 to $18 a week. Perhaps the general rate is about $12. Common laborers are worth $1 a day—good farm hands, 15 to $18 a month, and scarcely to be had at those rates. In regard to the expenses of living in this town, an idea may be gathered from the following statement of prices. Beef and pork are 3 to 5 cents a pound. Vegetables of all kinds very abundant and cheap in their season, but usually scarce and high during winter. Potatoes 25 cents a bushel. Corn meal 50 cents. Flour $11 a barrel. Butter (in summer) 12½ cents per lb., this winter it commands from 20 to 25 cents. Flour is usually worth from 3½ to 5 dollars a barrel, but the wheat crop has partially failed for 2 or 3 years past, and consequently the article is high.—Fowls are worth from 8 to 12½ cents.—Families who are provident, and lay up their stores at the right season of the year, can live here moderately. A cow can be kept during summer without any expense, as they get their living on the praries, and thrive on the abundant pasture they afford. To winter a cow would cost about 5 or 6 dollars, and for this small yearly expense, a family may have an abundant supply of milk.

One great advantage an enterprising family enjoys here, is the facility of getting a dwelling house of their own. A lot may

be had for 50 or 100 dollars, and a house, small, but sufficient for a contented family, may be put up for two or three hundred.—To do this is but the work of a year or two, and the man becomes a landholder,—his dignity is considerably heightened thereby. He feels an interest at stake in the prosperity of the town, and is far more likely to apply himself diligently to business, than while he had no such inducements to influence him.

It may be asked, will these advantages continue long? I think a short consideration of the causes which give rise to them, will show that they are like to continue for many years. The farming interest is the principle one in this State, and is eminently prosperous. The land is fertile, the climate propitious, and such a thing as a general failure of crops, I believe, is unknown. From the ease with which new farms can be made from the prarie, and from the immense extent of prarie land now lying uncultivated, the prosperity of the farmer must long continue as great as at present. For he will have no inducement to settle in any neighborhood where he will not be well paid for his labor, when by going a little further, he can buy his land cheaper and sell his produce for more. As long as there is vacant land in different parts of this State and in adjoining States, the farming business will continue prosperous. It is the farmers who chiefly support the store keepers and mechanics of the towns, and of course the prosperity of the one will insure that of the other classes. For the same reasons, merchants or mechanics will have no cause for crowding into any place in such numbers as to overrun the business, when there are new towns continually springing up, where their commodities and labor will be in greater demand. Many persons feel an unwillingness to emigrate to the West, under the apprehension that a sort of semi barbarous state of society exists there—that the people are rough and uncouth in their manners, and without education and refinement. On this subject, I would remark, that most of the inhabitants of this State, are emigrants from the older States of the east and south, who brought with them all the education and refinement they possessed there. Enterprise and energy eminently characterise them as a body.—It was those traits of character that led them to seek this new country. In this town, you may go into a church on Sunday, and see an assembly as genteel in appearance, and as attentive and orderly in their deportment, as a New-York congregation. And you may also hear as good a sermon. There is a much larger proportion of children in Sunday schools in this town, than in the city of New-York; and most of the benevolent enterprises of the day are patronized with a good degree of liberality.—The people in their manners are usually sociable and pleasing. Strangers are welcomed with cordiality, and far less suspicion and distrust manifested than in the older countries. Upon the whole, it is only necessary to become acquainted with the character of the people here to admire it.

At some future time, I shall probably enlarge on some of these topics, and also communicate some information respecting farming in this country.

E. R. W.

For the New-York Farmer.

No. I.

GENERAL SKETCHES.—NEW-ENGLAND AGRICUTTURE.

By H. C.

I propose to sketch some very general views of the Agriculture of the Northern and Western parts of the country, which I have had recently the gratification of visiting. With much of New-England, I have been long acquainted; and this season has afforded me the opportunity of seeing some of the Western parts of New-York, the North-Western and central parts of Pennsylvania, and parts of Michigan, and Ohio, not under all the advantages, which I could have desired; but with as many as usually fall to the lot of travellers in their transit over the country, by the usual public conveyances.

There is a strong impression prevailing, and not without plausible reasons, that the Agriculture of New-England is on the decline; I do not mean in respect to the character, but the extent of the cultivation. Much less land in proportion to the population is under cultivation than was under cultivation twenty years ago; though in respect to the modes of cultivation, and the utensils employed, especially the plough, great improvements have been made. The amount of crops, from the same extent of land, has been greatly increased, and they are more carefully husbanded than formally. Yet it is a discreditable fact, that New-England is dependant upon other parts of the country for the common necessaries of life; and has little to export, excepting perhaps a small amount of beef; and the amount of this article, which New-England exports, does not exceed that, which is brought here alive from other parts of the country.

Maine, with an admirable wheat soil in many parts, grows comparatively little; and wheat flouer with the Rochester, N. Y. brand upon it, is to be found far in the interior, a hundred miles, it may be, from the sea coast. Little Indian corn is produced, and small quantities of rye. Oats are raised in considerable amount; but not more than is demanded for home consumption. Excellent patatoes are produced; and of these as well as of hay some are sent to the capital of New-England, and there is an occasional shipment to the Southern cities. A good many cattle are driven from Maine to Brighton and likewise into the British provinces; and, as grass fed cattle, they are of a good description; but agriculture in Maine, though the State, notwithstanding its climate, possesses in this respect great advantages, cannot be set down as a primary interest of the State. The fisheries, and especially the lumber business, are the great objects of pursuit.

New-Hampshire is even in this matter, behind Maine, and this from the natural condition of the soil. To a stranger unacquainted with the hardihood and spirit of the people, it is matter of difficult solution how the inhabitants of this State are sustained. There are it is true, some sunny spots. Some extremely well managed and beautiful farms are to be met with in Greenland near Portsmouth. There is some good cultivation near Exeter and in Salisbury on the Merrimack. There is excellent, I may justly call it, pattern farming among the Shakers at Canterbury and Endfield, where all that persevering industry and untiring labor, applied with skill and judgment can accamplish, seems to have been done. There is excellent farming in that part of New-Hampshire, which lies upon Connecticut river; at Walpole, Charlestown, Claremont, Lebanon, Haverhill, and Lancaster. But a considerable portion of this State is doomed to perpetual unfruitfulness; is covered with mountains of granite, which defy all cultivation, and subject to late vegetation in the Spring and early Autumnal frosts, discouraging to the enterprize and often fatal to the labors of the husbandman. Indian Corn is in most parts of the State a precarious crop. Wheat, in those parts of the State where it is at all cultivated, has for three or four years, been much cut off by the grain worm. Rye is in no part of New-England a large crop; and this too, has suffered severely from the same pest. Some small amount of cattle are raised, but the severity and length of the winters make this an expensive process.—On some of the Connecticut river lands the crops of oats have been abundant, in some instances rising to ninety bushels to the acre; but nothing like this is to be generally calculated upon and hardly an approach to the necessary supply of bread stuff is at any time produced in the State. There are some

valuable intervale lands near the head waters of tne Saco, which present favorable examples of good cultivation; but they are quite limited. Considerable portions of the State are well adapted to the growth of wool; and at present New-Hampshire may boast of some as well managed flocks; and the production of some as fine wool as any part of the world can furnish.

Vermont is, undoubtedly, the best as it is the most exclusively Agricultural State in New-England. The Indian corn crop in Vermont, is, however, a very precarious crop on account of the climate; and it produces at present, comparatively little wheat. Wheat was formerly cultivated in Vermont with much success, but for various reasons the cultivation for a few years past has fallen off. Wool is now the great object of attention, and the sheep husbandry is pursued with eminent skill and advantage. Vermont likewise may boast of some of the finest dairies in the country; and a large amount of butter and cheese are sent out of the State. The town of Barnet, on the banks of the Connecticut, has been long and deservedly celebrated for its careful cultivation and excellent dairy produce. The Agriculture of the towns on the Western side of the mountains, and on the lake shore is very superior.

The Agriculture of Massachusetts, is, with few exceptions, in a comparatively humble state. Of bread stuff, it produces but a small part of its necessary supply. Of wheat, a very small amount is raised. Of rye, much more than of wheat, but the amount is not large. Indian corn is more largely cultivated, but the farmers, who produce more than five hundred bushels per year, are a small number. Barley is cultivated to some extent in some parts of the State; in others the cultivation has been abandoned on account of the grain worm, believed to be the same by which the wheat has been cut off, but this fact is not as yet ascertained. Oats are a small crop, and great quantities of horse feed, oats, corn, and hay are imported into the sea ports and their vicinity, a considerable amount of broom corn is raised; and the brush is manufactured and sent into different parts of the Union; and the hops grown in this State, Vermont, and New-Hampshire, form in some years a notable article for exportation. Considerable beef is fattened in Massachusetts; and Worcester and Berkshire counties especially, are extensively engaged in the business of dairying. A large amoun of wool, and some of the finest qualities are grown in this State. The culture of the mulberry and the feeding of silkworms are begining to be objects of attention. Some hemp and tobacco are raised, but the cultivation is quite limited. Massachusetts however, though highly spirited, enterprising and liberal in her agricultural improvements by means of well managed societies, liberal donations from the State, and the disinterested efforts of many eminent individuals, has comparatively little agricultural wealth; the farms are generally small, and in many cases cultivated as an appendage to a trade, profession, or some commercial pursuit.

Rhode Island is essentially a manufacturing and commercial community. With the exception of a few favored spots, the soil is sterile and hard of cultivation. The Island itself, from which the State derives its name is singularly beautiful in its position and aspect, in most cases, of a strong and productive soil, and having singular advantages for obtaing manure on account of its proximity to the sea. Much sea grass, rock weed, and kelp are obtained, and in some places fish, the munhaden, which are taken in great abundance, are freely and successfully used. With the exception however, of the product of potatoes, and especially of onions, which it grows to a large extent, the State has no agricultural produce to export; and is almost wholly dependant on other places for its supply of bread.

Connecticut likewise is a manufacturing State; and agriculture scarcely exists as an exclusive profession. Some parts of Connecticut have been long remarked for the extensive cultivation of Onions, and a considerable amount of wool and tobacco is raised in the State, but its agricultural products are by no means equal to its wants. Connecticut has some large, and is full of small, manufacturing establishments; and no part of the United States has a greater appearance of neatness, comfort, and good economy. Its manufactured articles are found in all parts of the Union.

It is sometimes asked how, with a soil and climate not very propitious, the Yankees live, and live in comfort; and if they do not acquire large and overgrown fortunes, yet present more than a fair proportion of examples of humble competence, and as much independence as usually falls to the human condition? The answer may be comprehended in three words, industry, enterprise, and frugality. Climate and soil may be against them, but the condition in which Providence has thrown them, contributes to nourish a spirit of self-dependance, and to form a hardihood of character which is the foundation of their success. Their enterprise carries them into all parts of the country, and the world; and if the usual traits of the Yankee character go with them, their enterprise seldom disappoint their calculations.

I trust it was not mere prejudice, for of that I should feel quite ashamed; that in travelling through the new parts of the country, I persuaded myself that I could, in most cases, point out a Yankee settlement or homestead, without inquiry. In several instances, where I attempted the experiment, the inquiry confirmed my conjectures. There was a certain air of carefulness about the house and out-buildings, which distinguished them from most others. I am far from thinking their ways are always best; and as it respects agriculture, they are far behind the Pennsylvania Farmers; but in the capacity of "getting along" on small means, and with honor, comfort, and independence, no people surpass them.

The Yankee too has an officiousness in other men's matters, which if it has its evils, as it is sometimes complained of, it is not without its advantages. He no sooner plants himself in any situation, than he has a "notion" that the community would be better for good roads, secure bridges, a school house, an academy, and a meeting house; and these matters, in general standing in pretty close connection, usually, though silently, announce, who presides over the municipality. The Yankees have a propensity too to have their houses painted, their yards neatly secured, their gates on the hinges and shut, and the pigs kept out of the hall and the front parlour.

This appearance of neatness, care, frugality, and thrift, indicates generally the residence of a Yankee settler; and leads us back to the circumstances under which such a character is usually formed.

With a hard and unpropitious soil, a severe climate, and a population which, if confined to its own resources, would press sorely upon its means of subsistence, he is compelled to labor and exertion, that he may live; obliged to gather up the fragments that remain, so that nothing shall be lost, he is trained in habits of extreme frugality; and his invention is continually toned and stimulated by the great spur of necessity, and a spirit of enterprise aroused and cherished, that he may increase his resources. When the Yankee emigrant carries these habits with him to his new place of residence among the fertile lands of the West, success and wealth are certain; but it too often happens, that when he finds himself in a situation where such constant and strenuous exertions are not required, and he discovers that even moderate exertion is most amply rewarded, far beyond his experience and even his imagination, the love of ease, almost an essential element in the human constitution, prevail over his

early habits of industry; abundance begets extravagance and waste; he sinks into the negligent habits of those around him; and stops short in the very midst of improvement. H. C.

January, 1837.

DIED, on the 16th inst. at his residence at Baldwinsville, of inflammation on the lungs, Col. STEPHEN W. BALDWIN, in the 42d year of his age. Col. Baldwin has done much to advance the interest of the place in which he lived, and was highly esteemed in all the relations of life. In his dealings he was just towards all, and the poor always found in him a friend. Those who knew him best will most justly appreciate his worth, and most deeply mourn his loss.—[Onondaga Standard.]

AMERICAN JOURNAL OF SCIENCE AND ARTS, Jan., 1837.—A valuable number of this work so creditable to American Science. A memoir of the Rev. Dr. Prince, of Salem, and several contributions from gentlemen of talents, will interest the general reader.

The articles of Dr. Feuchtwanger, and also those of Dr. Hare, are well worth the attention of the chemical reader, particularly the latter, on new and curious combinations in essential oils.

Several Zoological notices by Dr. Haxlan are also of high merit.

JOURNAL OF THE AMERICAN INSTITUTE, Jan., 1837.—This Journal again makes its appearance in the usual neatness of execution, and value of material. Several articles in it are of particular interest.

A TREATISE ON THE PRINCIPAL MATHEMATICAL INSTRUMENTS, EMPLOYED IN SURVEYING, LEVELLING, AND ASTRONOMY, explaining their construction, adjustments, and use, with tables, by T. W. SIMMS, Assistant at the Royal Observatory, Greenwich. Revised with additions by J. H. ALEXANDER, Civil Engineer—F. Lucas, Jr., Baltimore. An American edition of an English work, written by a gentleman well versed in the scientific and practical knowledge of Instruments.

The principles of the construction of the instruments are clearly explained, aided by very good cuts—and the details of their adjustment, are very well described.

The latter subjects are followed out a length as regards both Surveying and Astronomical Instruments.

The value of the work is also increased by the Tables at the end—they are of great use to Engineers, Surveyors, and Astronomers.

The portability of the work is a great recommendation, and the information added in the American Edition, being suited to the practice of the profession in this country, it will be found one of the most useful and convenient works that an Engineer can use.

While on this subject, we must remark, that the principles of construction and adjustment of many of the most commonly used Surveying Instruments, are far from being well understood. Mistakes of the most glaring nature have come under our own observation, and in persons otherwise thoroughly understanding their instruments.

Instruments are also very liable to get out of order while in use, and that too in places where an instrument maker would be a *rara avis*. To all persons in such a predicament, a slight knowledge of the principles of construction of their instruments will be invaluable.

We know of no work more useful in all such emergencies, than this treatise of Mr. Simms.

From the Farmers' Register.

THE PROPER DISTANCES FOR PLANTING CORN.

I hold it to be an axiom, that any subscriber to a useful and punctual periodical, who does not contribute to its support, by paying his subscription, and furnishing any useful facts or theories of which he is in possession, is worthy of any punishment which a jury of editors would inflict.

Not choosing to subject myself any longer to the penalty due to such an offender, I send you my subscription and my mite of matter. The first will, I hope, justify you in paying the post, whether the latter is worth printing or not.

In this world of fancies and Yankee notions, each man has his hobby. Some ride to the south, some glide swiftly on the bosom of the smooth canal; some fly through the air in balloons; some rattle on a railroad, and I, Mr. Editor, ride into my cornfield, and speculate on the value, while I am enraptured by the beauty of that queen of plants.

While all the world is agog for cotton, the poor corn is neglected by all but those who eat it. Let us turn our eyes to it, while I give you the results of some experiments and calculations on its culture.

On the Eastern Shore of Virginia (that most prosperous of all corn countries,) I am told it is the habit of the planters to plant their corn four feet each way—a single stalk at a place. When I first commenced farming, my impression was, that the most economical method of cultivating corn, all things considered, was to plant it so as to plough it both ways, and thereby dispense with the hoe-work. I tried it. Experience and reason have changed my opinion. In 1835, I cultivated a light sandy field in corn, (much such land as that on the Eastern Shore, but not so good.) Part of it I planted 5 by 3, and part (the best land) 4 by 4 feet—both were ploughed both ways, and received the same culture: the cut 4 by 4 was favored rather the most, because it seemed to suffer. The result was, the corn 4 by 4, suffered for distance, while that 5 by 3, had a plenty of room, and was a good crop. This set me to thinking—and the result of my cogitations amounted to the conclusion, that corn must have a plenty of distance one way; else why was the corn 4 by 4 too thick, while that 5 by 3 had distance enough—when there were more stalks on an acre of the latter, than on one of the former—which reminds me, that many persons, and they intelligent and educated farmers too, think—no, conclude without thinking—that because 4 and 4, and 5 and 3, and $5\frac{1}{2}$ and $2\frac{1}{2}$, 6 and 2, and so on, when severally added, make 8—that, therefore, there are the same number of stalks on an acre, planted in either way.

This you know is not the fact—on the contrary, the number of stalks is inversely as the *product* of the two numbers. For instance, the number of stalks on an acre 4 by 4, is to the number on an acre 6 by 2, as 12 is to 16. The reason is this—more land can be contained in a square, than in any other rectangular figure—consequently, there are few squares in an acre, than there are of any other rectangular figure—so, also, the nearer these figures approach to a square, or the farther they are removed from one, the less, or the greater is their number.*

This important consideration, together with the fact above stated, resolved me to cultivate my corn this year on a different plan.

I accordingly planted it $5\frac{1}{2}$ feet one way, and $1\frac{1}{2}$ to $2\frac{1}{2}$ feet the other, according to the quality of the land. My corn was as good, and better, worked in this way, and I cultivated it with little trouble. By using an X wooden drag, twice in a row, about a week after each ploughing—first, when the grass begins to spring, you leave your land as level and keep it as clean, as you can by cultivating it in any other way—hoe or no hoe. Moreover, the greater the distance one way, the less your corn will be ridged by ploughing; and, therefore, the more dirt you can throw immediately around it without injury. If I am wrong in any of my deductions, I hope you, or some experienced corn planter, will put me right: for, until experience or reason changes my views, I will plant any land 6 by 2, which, according to old style, would be planted 4 by 4. There are $\frac{1}{4}$ more stalks on an acre of the former, than on one of the latter. I contend the last is the thickest. In the mean time,

I am, yours, &c.

SIX AND TWO.

---

*The proper and simple rule for comparing spaces, or distance of plants, is to multiply the length and breadth together, and thus ascertain the number of square feet given to each plant, or station. Thus 4 by 4 feet, makes 16 square feet, and 6 by 2, 12 feet only. Yet simple and obvious as is this truth, it is both true and surprising, (as stated by our correspondent,) that many old and experienced corn planters still compare the spaces, afforded by these and other different distances, by adding, instead of multiplying the length and breadth together.—ED.

From the Farmers' Register.

PLASTER OF PARIS ON MARLED LAND—GREEN SAND.

DECEMBER 18, 1836.

When I commenced farming, some years ago, I began to use plaster of Paris and clo-

ver; but finding severaly beds of marl, whic I soon worked to a considerable extent, discontinued the use of plaster. This wa done the more readily, because my exper ments had not satisfied me of its efficacy and I considered the marl, which rendere certain a moderate crop of clover on almos any land, a substitute for the plaster Las spring, Mr. C. of S., riding with me over my fields, remarked that the clover was un usually well set. but that the crop was too light. This I ascribed too the coldness o the season, and the want of strength in the land; but when told that it had not been plastered, he attributed it to that cause, and strongly urged me to have it done immedi ately. Rather at his instance, than from any expectation of benefit from it, I ordered some ground plaster from Haxall's mills, and had fifteen or eighteen acres of clover, of one year's growth, sown with it at the rate o. about three pecks to the acre—but I regarded the experiment with so little interest, that I did not visit the place again until after harvest, and then for the purpose of marking the spots where manure would be required before the land was fallowed for wheat. I soon came to a place where the clover was inferior to the rest of the crop, but to my surprise, I found it continued so through the whole length of the bed. Passing on further, I observed the same was the case with another bed, and then I recollected the plaster. Some six or eight beds which by my directions had been left out when the plaster was sown, were most conspicuously inferior to the rest. On them the clover was small and yellow, while that which had been plastered, was fresh and green, and vigorous, and seemed to have taken a second growth. The crop there, was more than twice as heavy as on the beds which had not been sown with plaster. I never saw an experiment that was more convincing. It is entitled to the more weight, because it was made by one who did not anticipate such an effect, and its result forced itself on his attention at a time when it was not directed to the experiment. The plaster was sown about the last of May. Its effect would probably have been much greater, had it been sown in April, and in a larger quantity to the acre. The difference in the crop of clover was such as to pay for the plaster five times over.

The land had been marled with 600 or 800 bushels to the acre, some years before.

It is late in the day to be attesting the virtue of plaster of Paris, but I communicate my experiment, because it was made in conjunction with marl; and on land, level, grey, and inclining to sandy, to which plaster has not been supposed to be favorably adapted. Incredulity is much more easily removed by our own personal observation, than by the reports of others; but if this shall induce any one similarly situated to make the same experiment, he will find it much to his advantage. W.

From the Ohio Farmer.

LOCATION, SOIL AND CULTIVATION OF THE MADDER CROP.

A location facing the south or south-east is to be preferred. A sandy loam not ove. stiff and heavy, or light and sandy, or a ood brown, deep, rich upland loam, free om foul grass, weeds, stones or stumps o es. Where a crop of potatoes, pea rn or wheat, has been cultivated the pa ason, plough deep twice, once in Septem er and once in October, and if rather stiff it lie after the plough until spring. When he spring opens, and the ground has be come dry and warm, (say in Tennessee, 1st of April, Ohio 15th, and New-York 25th to 1st of May; I speak of the spring of 1836.)

Plough again deep, the deeper the better. then harrow well and strike it into ridges with a one horse plough, three feet wide, and four feet vacant, or making a ridge once in seven feet, raising it, if on rather moist ground, eight or ten inches, and dry and six or eight from the natural level, then with a light narrow level, and shape the ridges like a well formed bed of beets, &c.

We will suppose you intend to plant one acre of ground, and that you have purchased 8 bushels of top roots in the fall and buried them like potatoes on your premises—count the ridges on your acre, and take out of the ground, one bushel of roots, and plant it on $\frac{1}{8}$ of your ridges; you will then be able to ascertain how to portion your roots for the remainder.

The following is the manner of planting, cultivating, &c., when the quantities of ground do not exceed three or four acres. One person on each side of the ridge to make the holes, (plant four inches below the surface of the bed, or thereabouts, when covered,) one on each side to drop the roots, and one on each side to cover, pressing the mill like that of planting corn, or three persons on one side, as the case may be, whether your have one or more acres to plant. Let the owner be the dropper of roots, and his most thorough assistants behind him. Make the holes from twelve to eighteen inches apart, and about six inches from the edge of the ridge. As the plants are supposed to have been purchased in the fall, the roots may have thrown out sprouts, and possibly have leaved. In this case, in dropping and covering, you will leave the most prominent sprout or sprouts a little out of the ground, as where a plant has leaved, it ought not to be smothered.

When the plant gets up three or four inches, weed with the hoe, and plough with one horse, between the ridges or beds, but not on them; this will take place 2 or 3 weeks after planting. When up 12 or 15 inches, many of the tops will fall; assist them with a ten foot pole; two persons cross them each way across the bed, cover them with a shovel or garden rake, throwing the soil from between the ridges. After loosening with the one horse plough, you will, with a shovel scatter the earth between the stalks rather than throw it into heaps; of course we wish to keep the stalks separate, as they are to form new and important roots in the centre of the beds. About the 20th of June, you may plough between the beds, and scatter more earth on the fresh tops, (all but the ends) and when you get through, you may plant potatoes between the beds if you choose. I do not recommend it, if you have plenty of land, although I raised 1070 bushels of Pink Eyes on eight acres the first year, and 60 bushels of corn. If your land is perfectly clear of weeds, you ve through with your labor on the Madder op for this year, except in latitudes where here is not much snow, and considerable frost; this case cover in October two inches or hereabout. 2d year; same operations in weeding, but no crop between; cover once n June. 3d year; weed only; 4th year; weed in the spring, if a weedy piece of ground.

Begin to plough out the roots in Tennessee, [3 years old] first Sept. Ohio [4 years] ame time. New-York, 15th or 20th, after utting off the tops with a sharp hoe. In ploughing out the roots use a heavy span of horses, and a large plough. We ought to choose a soil neither too wet or too dry, too stiff or light. Shake the dirt from the roots, and rinse or wash, as the soil may be, stiff or light; dry in a common hop kiln; grind them in a mill after Wilson's Patent Coffee Mill; this mill weighs from one to two pounds. The madder mill may be from 60 to 80 lbs. weight. Grind coarse, and fan in a fanning mill; then grind again for market. The profit of this crop is immense; the exhaustion of soil trifling, and glutting the market out of the question.

The Editor of the Albany Cultivator, vol. 2, page 20, says—"It is principally cultivated in Holland, the province of Zealand, being literally covered with it, from whence it is exported to every part of Europe and America, yielding almost incalculable profits. The import of this article for the use of our manufacturers, is said to amount in value, to more than two millions of dollars annually." Mr. Jefferson, while minister in France, writes: "They cultivate madder there at immense profits; they dig it once in five or six years." I have before me a communication from a cultivator of the article, (see Cultivator, vol. 2, page 93,) who makes the clear profit to amount to $888 30, on an acre once in four years. The lowest amount of profit that I have known on an acre in four years is $300; the highest 1200; this last included the sale of top roots for planting. The amount will vary according to the soil and cultivation. I have unquestionable evidence that one hill (2400 to the acre) has produced in five years, 4 lbs. of kiln dried madder; another at five years old, 6 lbs., another wherein they took uncommon pains with the hill, 8 lbs. 8 oz. Mr. Woodbury of Winfield, Herkimer county, N. Y., the writer of the abovementioned communication, purchased in the fall of 1834, one-fifth of an acre of madder 4 years old and planted in hills, (far less productive than if planted in ridges) for which he paid $80, and dug from it one thousand one hundred pounds. After it was kiln dried, he sold it for 18 cents the pound. The usual yield for four years is 3 pounds to the hill, where the land is first rate, and the cultivation is performed by a snug farmer. The crop increases something like the following ratio, viz. 1st year, small growth. 2d, double, 3d, equal to the two first. 4th, equal to 15 per cent. on the whole; at least this is my opinion, not having dug any that was five years old. Madder grows, and the stalks are fresh, in any of the middle and western States until killed by a hard frost, and is almost the first vegetable that starts in the spring, hence I should suppose that madder in Tennessee, at 3 years old, would be equal

to four years at Birmingham, Ohio; four and a half, Oneida county, New-York; five years Winthrop, Me. The cultivators of Holland and France, from whom we draw most of our supplies, and most of the agricultural authors of those countries have been silent on the subject.

I am located in the rich bottoms of the Vermillion river. I, in connection with another person, plant this spring 10 or 12 acres. As I have always been of the opinion that a madder soil should be composed in a great degree of decayed vegetables, I think I shall get in four years from 5 to 6000 lbs. of dried Madder per acre. I have a good upland 1½ acres, planted some time since, from which I can spare enough roots next fall, to plant 6 or 7 acres. The price will be, in the fall, for 6 bushels, $24; over 6 and under 12, $3 50 per bushel; over 12, $3.

Birmingham is 38 miles west from Cleveland, Ohio, and 14 miles south-east from Huron, Ohio. Messrs. Wickham & Co., Forwarding Merchants, Huron, will be applicant's agents, to whom funds may be forwarded for the purchase of roots; P. E. & E. B. Bronson, Birmingham, owners, or R. Bronson, Manager. All letters on this subject must be post paid to meet with attention.

I had been in the practice of using the "Rubin Tinctorum, or Dyer's Madder," for many years previous to embarking in the business; and before I commenced, I ascertained that the price of the imported article, was worth (the preceding thirteen years, on an average, in the New-York market,) 15 cents per lb.; the ten years preceding the thirteen years, it was worth 25 cents, and in that time have known it worth 44 cents. In my early communications to Editors of agricultural papers, I stated the crop would equal 2000 lbs. 3 years old, but did not dream that 4 years would produce an average of 4000 lbs. on good land and good culture. The cost does not exceed 4½ cents per lb., exclusive of selling top roots for planting. They may be sold with profit at three years and even two years old.

It is surprising to me that no more than sixty acres is as yet under cultivation. There will be about one hundred acres planted this spring, and from forty-five thousand to seventy-five thousand acres wanted for the consumption of the United States, and England as she cannot grow the articles, imports all she uses. I say she cannot grow it to advantage; her summers are too moist and cool. It is more absurd to let foreign nations export madder to this country, than to let them export wheat or wheat flour. It is more hardy than the potato crop. It is worth three cents more per pound, than the best imported. As a proof, no imported madder can be sold where this has been kept for sale. The difference consists in this, that the brightest roots are selected in the field in those countries, dried and ground, and sent to England. They use it in dyeing their Adrianople, or Turkey red, on cotton; the rest dried, (without rinsing) ground, and sent to America. In this country, a prudent cultivator rinses, dries, and grinds altogether; then fans or separates the loose bark and small fibres from the pure article. The refuse is used for ground of many colors.

Madder is used in whole, or part, for the following colors on wool, both in England France, and America, viz: blue, black, red buff, olive-brown, olive, navy-blue, and many others; finally it produces one of the most beautiful, durable, and healthy colors that is at this time dyed; as for calico printers, it enters greatly into their dyes. The city of Lowell, in Massachusetts, uses thirty thousand dollars worth per year. A war with France would raise the article to thirty-one cents per lb., in the New-York market. One small establishment in Otsego county, New-York, uses equal, each year, to three-fourths of all that is raised in the Northern States at this time.

The reader will now inquire why have not the farmers in the United States, entered into the culture of this article, and completely glutted the market? I will answer, that most of them want their profit at the expiration of each year, not thinking that the horse or ox is four years old before it is profitable to sell. But there is another difficulty. I have before observed that there was wanting, for the consumption in the United States, from 45 to 75,000 acres. The amount of Madder roots, for planting, dug last fall, was 1000 bushels. There will be planted this spring, say something more than 100 acres; next fall there will be for sale, roots amounting to 250 bushels, and next year, enough to plant 200 acres. Probably it will take ten years or more, to procure a supply of roots to plant, equal to the consumption of 1835—6 or 7. I have before me a communication from a respectable correspondent, detailing the mode of cultivation in Holland and France, together with queries, requesting my answers, which I will most cheerfully give, and will be forwarded to be inserted in your paper, should you deem the above worthy of publication.

I have for many years past, believed that the soil and climate of Ohio, was peculiarly favorable to the culture of silk, madder, and the grape for making wine; and having resided here in course of the last and present years, several months, I have been more and more confirmed in that opinion. What hinders this State from rising in rank above New-York? Let every farmer take an agricultural paper, and improve the privileges that nature has given them. I have examined the soil and privileges of this county in particular, and do not hesitate to say, I believe that it equals any part of the United States. There is, I believe, no desirable fruit or grain that grows north of Philadelphia, but what flourishes here. It is certainly a most desirable soil and climate, compared with that of the middle counties of New-York. Many of the farmers of this section, only skim the surface of the land with the plough. What hinders the water, in the spring and fall, from settling in the ground through the sub-soil, and bursting out in springs?——Shallow ploughing. What hinders the farmer from obtaining thirty bushels of wheat to the acre?——Shallow ploughing. I wish I were able to commit to paper all I feel in favor of manual labor or agricultural schools, backed by numerous agricultural papers, containing communications from a Buel, a Colman, and a host of other scientific and practical farmers. I am not a practical farmer, in a large way, myself, but the aid I have received from perusing those papers, for a few years past, has been of great benefit to me—yes, ten times the expense of four agricultural papers per year.

Not being brought up on a farm, how could I exercise judgment in the selection of a horse, ox, sheep, or hog? I read the communications of writers of acknowledged reputation, on the subject, and compared their arguments with my own reason, improved by previous reading, and made my choice. How should I be able to select and cultivate the various grains and grasses, or to till the ground to a proper rotation of crops, or select and engraft with my own hands the best fruits in the country, and last, though not least, to have a good garden?

I might go on and multiply reasons why I will patronize agricultural papers; but knowing my inability to do justice to the subject, and fearing your readers will think I am fishing for some particular individual, I will conclude with wishing you and your brethren in the cause, many subscribers, and that you will consider me one of them.

R. Bronson.

Birmingham, Huron County, Ohio.

From the Farmers' Register.

FARMING ON THE RIVANNA.—CORN CULTURE—CLOVER—MANURING.

November, 23d, 1836.

Admonished twelve months ago, as well by a sense of duty, as by repeated calls on the subscribers to your valuable journal, for practical communications—I then devoted part of a rainy day to giving to it a modicum of my experience. But unwilling to obtrude my opinions on the public eye, sharp-sighted as it had become from light recently shed on your paper by a discussion among some of our most distinguished agriculturists, I declined offering my meager essay at so inauspicious a period.—*Another rainy day*, however, and the annual business of arranging papers, force it on my notice, and I fear you will have cause to regret that there are not still combatants on the arena, from whose observation I might willingly hide my diminished head. And yet, having made agriculture my profession from the outset of a business life of more than twenty years, I feel more unwilling to acknowledge ignorance than to expose, as I may do, the imperfections of a practice, which has not been without its success. Not entering on the wide field of the vexed question of *rotation*, further than it must necessarily be involved in the tendency of my remarks, I shall content myself with defending *that* which I have practised for 15 years—avoiding any attack on other systems; and thus, Mr. Editor, I hope to escape the ungloved handling to which a different course might subject me.

Although standing under the shadow of a name which would give but little weight to the manuscript that has so long laid on the shelf, I still feel a repugnance at the egotism of entering so minutely and personally into details that may afford little, or *no* benefit to your readers—and there-

fore, as *some apology*, (though at additional expense to your columns and *their* patience) have ushered it in with this exordium.

It is not unimportant to mention that four-fifths of the arable lands of the farm which is the subject of this communication, consist of what is denominated, above the falls of James River, first and second low-grounds, which being level or gently undulating, with generally a deep soil, admit of the advantageous use of four-horse ploughs—not admissable on rolling, or shallow lands. This farm was put under a three field course in the autumn of 1832. Field No. 1. being then sown in wheat was laid down in clover, for *the first time*, in January following. Nos. 2 and 3 taking their rounds in corn, &c. wheat and clover, it will be seen that No. 1, comes under cultivation for the crop of 1835. The clover having been very fine, without a hoof, and scarcely a scythe put into it, the land was in a condition to give its best return.

As in the preparation for, and cultivation of the corn crop, it involves many of the details of the three-field system, and from its intrinsic value and the labor usually expended on its culture, constitutes as important an item in Virginia husbandry as any other—I will submit my plan of managing it through all its stages.

The above field, (No. 1.) was laid into beds of 14 feet width, by four-horse Loudoun bar-shares, carrying furrows from 8 to 12 inches deep, (according to depth of soils,) and 17 wide. The corn, and tobacco lands being selected, as well for their fertility as level surface, on account of the liability of broken lands to *wash* in hoe-crops, were first ploughed. This being done before the new year, they were put in the finest tilth by the agency of frost, assisted by the opening effect of a clover ley and deep ploughing, with its necessary adjunct, cross-draining, by *deep-grips*.

As soon in March as it is *perfectly* dry, the corn-field is harrowed diagonally across the beds with heavy wheat-drags. At the time of planting, when the earth is warm, and buds begin to spring, (regardless of dates,) the same drags are passed three times lengthwise the bed—three rows being laid off on each, with a single mould-board plough, carrying a clear furrow from 2 to 3 inches deep. The seed corn having been steeped in liquor from the farm-pen, one night, and rolled in plaster the following morning, is dropped by hand, from 4 to 6 grains in a place, (as I am opposed to replanting,) at the distance of eighteen inches. It is then covered with an implement—being a frame with two coulters placed side by side—the frame so closed as to bring the coulters *just* within the laying off furrows. This raises a slight list over the grain which prevents the taking effect of the hasty rains, and acts as a cultivation. Hoes follow after, brushing off the clod that may be left on the list and covering exposed grains. When the corn is about six inches high, single horse mould-board Ploughs are introduced—commencing their operation in the middle of the balk with the bar next the corn, flushing the whole and finishing as near as they can be gotten to the row. A coulter follows in this finishing furrow, with the foot of it so turned under, as to move every plant in passing. Then come the hoes trimming down this narrow ridge, and thinning to one stalk, except where there are missing hills, in which case, leaving two or more stalks to make up the deficiency. I also leave two stalks in every alternate or third hill, in extra rich parts of the field. As soon as the stalk will bear a heavy earthing with the same ploughs, the balk is thrown back. On account of leaving the field in the dryest state for wheat sowing, I give the water-furrow rows 5 feet distance—*laying by* the three last furrows with a two-horse mould-board plough.—This operation finishes the working of the field. My reasoning on which practice is, that a heavy clover ley being made by four-horse ploughs, beyond the reach of disturbance from the smaller ploughs, or the deleterious influence of the sun, affords a rich moist pasture for the roots of this greedy and thirsty plant, which I have observed, will maintain its color in *almost any* drought on this system.

I would not recommend beds of 14 feet width on *wet* lands—nor do I think them as suitable for corn *alone*, as narrower beds with two rows, as the middle row has the advantage of the others, and will *keep it* throughout its growth. But for wheat and clover, I give that width the decided preference. In ploughing such beds for wheat, after corn, they cannot be reversed with fewer than four horses, without leaving them too low in the middle. I therefore *raise* them with two, by first throwing out the corn stubble of the inside row, with a wide furrow, then filling it by running *wide* on each side; this gives to the beds a handsome arch, without leaving them too high.

To return to the corn crop, however, I housed from fifty-nine acres of the low ground division of the first field, (which is inferior to a large proportion of the second low grounds of the same,) 740 barrels of sound and large ears—the average yield being reduced, by the balance of that division having been taken off for tobacco, which requires the richest land. The advantage to the crop of corn from further working than is here stated, would, I think, be trifling; yet on account of the succeeding wheat crop, I would give about harvest, or immediately after, a *very shallow* brushing over with cultivators or hoes. But having under my system *full* crops of corn, tobacco, and oats, besides timothy meadows, all pressing at that season, it would certainly be injurious to bestow more labor on *that one*. In commendation of a clover ley with deep ploughing and efficient draining, as a preparation for corn, let me say that my predecessor told me after the above mentioned result was ascertained, that the same field, when I became possessed of it three years before, would not have yielded more than five barrels per acre. He too was a manager of high reputation; but had not enjoyed (having been an agent) the advantages of clover and its indispensable adjunct, *plaster*. These, with the exception of a thin top-dressing of *stained* straw on, perhaps, two acres of land in the same field (which had been abraded by freshets,) when it was in wheat, constituted the only manuring of the field. Although this teeming production cannot justly be charged, in the *first* rounds, to the three-field course, it certainly speaks loudly in favor of the rotation of corn after clover, particularly, when the succeeding wheat crop (of this year) was better than has been generally obtained this season. As to the result of a fair experiment of the system, I can only say, "*nous verrons*;" but must be permitted to add, that the *same* practised for 11 years on James River, on a farm less *kind* in proportion to fertility, exhibited a regular improvement.

Before taking leave of this branch of my subject, I must insist on the importance to a great product, of a close and regular distribution of the corn stalks—one only in a place—to prove which, I will give the result of *one* of the many experiments I have made. A frost occurred in *this county* in the spring of 18 4, which cut down the corn below the surface of the earth, and appeared to have totally destoyed it. Field No 3, was in that crop, 80 acres of which had been nicely weeded out with hoes and ploughs. I caused 3 intermediate rows to be laid off and planted in rare-ripe, making 6 on a bed of 14 feet width. A genial shower having occurred in the course of a week, the six rows came out together most beautifully. The first planting of course had the preference: but of the rare-ripe, five rows were left in the richest, *convenient* part of the field. One corner, containing 4,000 square yards, lying in such shape as to be measured with accuracy, (the corn no better than the balance similarly planted,) yielded 14 barrels of fine ears.

You, Mr. Editor, as well as your readers, are doubtless heartily tired of No. 1., but in justice to the three-field system, I must be allowed to dispose of the remainder of it. The tobacco and corn land being done with, that portion of the field requiring cleansing of pests, is put in oats; the fairest crop of clover—that is, that which is most clear of pests, which is generally on the hills in each field—is reserved for fallow in August and September.—Thus, as regards the clover fallow, mine is a modified three-field course. The whole field having been sown in wheat this fall, will be laid down in clover and other grasses, according to quality of soil and other circumstances, from the first of January to the middle of April, always applying plaster where the young clover assumes three leaves—which depends on the season. I will here remark, that I have succeeded best with clover sown in January. The open condition of the earth, from the effect of frost, takes the seed in deep enough not to be operated on by a sudden thaw which might cause them to vegetate on the surface, thus exposed to frost, and that still greater enemy to clover, drought: whereas, when buried more deeply, the seed vegetate at a later and more regular season, and are protected against being thrown out by the former, or killed by the latter enemy.

With all spear grasses, (under which I class those in most common use with us, that is, timothy, herds, and orchard grass,) I have found most success, (*after* the months of August or middle of September,) when sown from the 15th Marth, to the same date in April, because of the peculiar liability of these to be thrown out by frost, and therefore, their requiring good roots to resist it.

When the farm-pens are broken up in March, the whole of the manure from *them*, as well as that which has been made in the stables since the winter top dressing on wheat, is hauled out and ploughed in on tobacco, corn, and oat lands, which being in clover, require light and partial manuring. After that period, all that can be made by littering stock of every description liberally, is reserved for top-dressing at the time of sowing wheat, if there is leisure, (which I rarely have,) and during the frozen spells of winter. I find the stable manure best for winter dressing, as it goes further, being little more than well stained straw—and from its warmth, separates more easily in frozen weather than others. I also top-dress very liberally with wheat straw, thinly scattered on poor or galled spots of the wheat field, for which there might not have been a sufficiency of manure. The crop of young clover is insured by such dressing —as I have found plaster to act most efficiently on unrotted manure. I consider all top-dressing more or less injurious to *wheat* (unless harrowed in at the time of sowing, and in that case thoroughly decomposed,) as it affords a nursery for insects during winter, which prey on the crop in early spring.

Let me here take a passing notice of the modern system of reserving all the manure of a farm, for *surface manuring*. Among the objections to this plan, these strike me as most prominent. In the first place, the loss to the land which it is destined to enrich, of the fermenting process under furrow—this I consider material Then the waste in the manure itself, from evaporation, and *very* often, the total destruction of it from *fire-fang*. Suitable spells for applying it in winter, are precarious—and if the whole offal of a farm, as well as the leaves of woodlands convenient, are converted into manure, it will be found that the ordinary force of a well regulated, and of course, profitable farm, cannot accomplish the hauling and scattering of the *whole* stock. There are other seasons at which the teams and hands of a farm, on which due attention is paid to the division of labor, cannot be profitably employed unless in hauling and collecting manure or materials for it. Few applications of manure are more profitable, I consider, than that of covering the thinner parts of a clover field, after that portion intended for cultivation has been attended to. In these, the clover shoots through the covering before the scorching suns of summer occur, and protects the manure from evaporation, while the plant is generally repaid by the nourishment it receives. To conclude this chapter, let me pay a just tribute to that *multum in parvo*, plaster of Paris. Removed from the benefits so providentially given to the tide water country in the abundance of marl and lime at command, we should feel that our region was shut out from the face of nature, but for this richest of earthly blessings as a boon bestowed on us, for the wisest and most beneficent of purposes—though by injudicious practice, it has, I am sorry to believe, been productive in *its early abuse*, of as much injury as benefit to dear old Virginia. The practice to which I allude is that, of first stimulating the earth to an unnatural product of clover, and then robbing it of every spice—the result of his great effort—by the scythe and grazing, unaided by standing pasture, which is indispensable to *any improving* system.

I have thus, Mr. Editor, given you a faithful transcript of this record of my *practice*, as far as it goes. Could it have been abridged without mutilation, or doing violence to the unpretending object of the writer, it would have been: and I may add, should its destination, in a luckless moment to your readers, be the columns of the Register, instead of its more appropriate *shelf*, they may be assured, that tedious as is the task its perusal imposes, *they cannot* be more objects of commiseration, than he who seek in so dull a detail a solace from labors that he would fain forget, in that crowning reward of the farmer's toil, which a domestic fireside *alone* can give.

James River having gathered into her garners the greatest share of the profits of Virginia agriculture, and her farmers occupying, justly, the highest eminence of its fame—far as I am from detracting from either, especially the latter ascription—I should be recreant to the land of my adoption, were I to withhold from it the designation of my signature.

RIVANNA.

From the Farmers' Register.

GOOD AND INCREASING EFFECT OF MARL.

BERKLEY, Charles City, Jan. 3, 1837.

* * * * * *

Before closing this letter, I have an act of sheer justice to perform. Some sixteen years ago, you were liberal enough to allow me permission to procure several vessel loads of marl from your shores. These were applied principally to a belt of land, and running through a large field, which contained all the varieties of soil from a cold white pipe clay, to a light loam; all, however, greatly exhausted. Shortly after its application, I discovered a considerable improvement in the land; and with a view of equalizing the fertility of the adjacent ground, I applied a considerable quantity of stable and farm pen manure, to a strip on one side of the marled belt. The succeeding two or three years, both pieces exhibited fine crops: since that period, the difference between the marled land and manured belts, is every year more manifest; and I think, it may be said with entire truth, that the portion marled, is fully equal to the production of ten barrels of corn per acre. When last in wheat, my principal scythe-man, on approaching it, remarked to his fellow-laborers, "this is a monstrous growth of wheat—there must have been an old farm-pen here;" another replied: "It is no farm-pen, but the marl from Mr. Ruffin's." As I believe your journal is of great public utility, I sincerely wish you success in it.

And am respectfully,

BENJ. HARRISON.

M Vandael, holding an office in the Administration of the Finances, has returned from a three months' excursion, which he undertook by order of the Government in Flanders and Germany, to examine the cultivation of beet-root in these countries.—The documents which he has brought are to serve as the basis of the Bill which will be presented to the Chambers in the next Session for the taxation of home made sugar. The cultivation of beet-root and the manufacture of sugar from it is daily extending in Germany. There are already 120 manufactories established, and 15 more are now being erected on the banks of the Rhine.

On the 31st ult., M. Andre Basty, a proprietor of Milhaud, in digging in his vineyard for a well, at the depth of 4 feet from the surface, and 7 metres from the high road, discovered a leaden coffin, 5 feet 3 inches in length, and weighing about 500 lbs., and ornamented with bas-reliefs, lions, griffins, and groups of children under an arbor. The coffin contained a human skeleton, and around it were a small glass bottle and some small coins. The coffin was fixed in the grave by large fragments of rude brickwork, amongst which was remarked some carbonate of lime, and some stones like those found in Roman constructions. An examination of the monument left no doubt as to its Roman origin, and the mode of burial adopted led to the conclusion that the remains discovered were those of a military chieftain, who might have embraced Christianity about the commencement of its establishment. Two months ago, M. Basty found, at about 18 yards from the spot where the above was discovered, another leaden coffin, also containing human bones and a bottle, but those who discovered it ignorantly melted it down.

From the Journal of the American Institute.

COAL.

MESSRS. EDITORS,—This community, and, in fact, a large part of the country, are alive to the high price of coal. Winter is gathering upon them with increasing sternness; and although thus far not as frightful as the last, the dread that the worst is still to come, agitates and alarms. This condition of the public mind is calculated to bring forth advisers in scores; because it is a time when they will be listened to. Some favorite panacea becomes popular. The people, like suffering patients, are sure that they feel distress, and, like them, they cannot be satisfied until they have swallowed the popular remedy, or been bled or steamed, as the fashion at the time may dictate.

The sovereign specific—the grand catholicon—which will make plenty, and, of course cheapness, is free trade;—take off all du-

ties, and open your ports to the whole world, and all will be well. Petitions to Congress for this purpose have been circulated, and thousands have signed in the full belief that they were contributing thereby to mitigate the rigors of our severe winters, and bring our shivering inhabitants into a milder zone. I have been repeatedly accosted by those engaged in carrying around these petitions, to lend my name—to inform Congress that the weather is cold, and that fuel is high, and humbly pray them to pass laws to make us warm:—not exactly to legislate us into a milder climate, but to legislate down the price of coal, by taking off the duty, about $2 per chaldron, which is required to be paid on imported coal. Not having a particle of confidence in this prescription, I have sought for reasons from those who take such interest as to go from house to house and store to store, to beg signatures.

I have desired them to name an instance, when the means of a home supply existed, where a reduction of duties effected a reduction of prices. I desired them to examine the history of our tariff, and see for themselves whether reduced prices had not been the invariable effect of high protecting duties. I instanced to them cottons, leather, cabinet wares, hats, &c., which were among the earliest articles protected by high duties, and which duties have been regularly continued down o this; all these are now so abundant and cheap, that we are deriving a good profit while we undersell them in foreign markets to those very foreigners from whom formerly, before high duties were imposed, we purchased our supplies. Not a free trade coal advocate has been found to deny these facts.

I have not, however, been so fortunate as to shake the faith of a single man. It is opposed to their theory; they are suffering, and, like the afflicted patients, unwilling to submit to a gradual, but certain cure, they yield to the persuasions of the empiric, and shut their eyes against facts and experience. Some have said that coal is an exception; that all that is wanted is to break down the coal monopolizers, extortioners and grinders; that coal is necessary for the poor. I ask, is not bread, too, a necessary? Do not flour dealers monopolize? It has been stated, that there is a confederacy of monopolists extending from New-York to Buffalo; and it is probably truly stated, that a more universal scarcity in bread stuffs exist from the short crops of the last season, than has prevailed at any time within the last fifteen years.

The duty on foreign wheat is twenty-five cents per bushel. Are there not stronger reasons for the repeal of this duty, than even the duty on coal? Are the flour monopolists less obdurate? Is their combination more limited, or less effective? Is the future supply less certain? Let those who doubt explore the coal regions of the west, and they will find a supply, not thousands of feet below the surface, as in England, but forming the very surface itself, and of sufficient depth for the supply of not only America, but all Europe, for centuries to come. That the susply is inexhaustible, no one will deny. From the best calculations, it may, under ordinary circumstances, be afforded in our city at less than half its present price.

The supply of wheat cannot be relied on with the same certainty. Bad crops may occur. and reduce production particular years greatly below the common average, as they did the last year. No deficiency can happen in our coal beds. Why then these extortionate prices? Coal has suddenly superseded other fuel, not only in our populous cities, but in the country—for manufactures, for steamboats, as well as to warm our houses. Just as our forests had disappeared, our coal beds—those exhaustless magazines of fuel—began to be known.

It is but a short period since a few samples were brought here for exhibition. The last year there was brought to market, from three mines in a single State, 556,935 tons; and for the coming year, preparation for its supply are making upon a larger scale than ever. The ratio of increase from these mines alone, is such as must soon fully equal the demand, and new mines are constantly opening; and the competition, so highly stimulated by ready sales and high prices, must inevitably and speedily reduce the article to its minimum price, unless that competition is checked by indiscreet legislation. All that is required, is for more capital to be turned into the coal trade at home

If the facilities for the importation of foreign coal are increased by the repeal of the duty, the inducement for our capitalists to make extensive arrangements for supplying our market the next year is clearly lessened—probably to a tenfold greater amount than the increased foreign importation. The foreign importation is also calculated to derange prices. This consideration, in all probability, would influence the capitalist to withhold the employment of his money beyond what it ought to be invested.

The foreign supply, under any circumstances, will be but a drop in the bucket, when compared with our consumption. The foreign importations of last year were only 14,453 tons. If that amount were imported for forty years in succession, it would but a trifle exceed the amount procured the last year from the three mines I have already referred to. If the repeal of the duty were to be doubled, the foreign supply would amount only to a fraction, compared with the probable home supply of the coming year.

I defy those who desire the repeal of the duty on coal, to name a reason which does not, in full force, apply to wheat, and flour, and potatoes. The present prices of these latter articles, beyond the average of former prices, is quite equal to those of coal. The duty, in proportion to present prices, is as great; and the possibility of a real scarcity, from short crops, may happen to wheat, flour and potatoes, but never can to coal.

The quantity of coal brought to market for several years past, has doubled every three years. Our population requires about twenty years to double. The article is, therefore, increasing more than six times as fast as the consumers. Under these circumstances, we have nothing to do but to give competitien full play, and monopoly soon will get its quietus.

Suppose we admit, because coal is a necessary, and the price is high, that the duty ought to be repealed. The same reason will apply to every other necessary. We must carry the principle through, or stand charged with partiality; and in years of plenty, our markets would be glutted with the agricultural products of Europe, and our farmers made the sufferers. Motions and petitions would be offered in Congress to repeal the duties on other articles, and our whole social system would be disturbed and deranged. Pennsylvania would not be peaceable if, without a good reason, her great staple should be made an exception. Our whole protective policy must be demolished. To me it is folly to *endeavor* by a repeal of duties, to tempt our citizens to send their money three thousand miles, and employ foreigners to dig coal from the deep bowels of old England, instead of using it at home in rewarding our own industry, and by its circulation enriching our own people. It would be much sounder political economy to give bounties to encourage its exportation, and by these means break down the monopoly so loudly complained of. CLINTON.

That the price of coal will be regulated by supply and demand, will not be denied. The question then arises, will the supply be increased or diminished, by the repeal of the duty on foreign coal? We believe it will be diminished. With the coal dealers, who fully understand the subject, it will have no effect; but some sensitive capitalists will, no doubt, be influenced to withhold their money, which they might otherwise employ in the coal business themselves, or loan to others disposed to carry it on. The whole quantity that, under any circumstances, will, be imported, must be so small, that comparatively a very little effect on our coal operations will more than overbalance the increase from importation, arising from a repeal of the duty. The consequence will be, that coal will bear a higher price than if the duty is continued. And we are told, that some of the most intelligent coal dealers are perfectly willing for the repeal, and laugh at those who think by such means to affect their trade. In 1820, only 365 tons were brought to market from all the Pennsylvania mines. In 1835, 556,935 tons. Fifteen years, therefore, had increased the quantity fifteen hundred and twenty-five times. No monopoly, if the business is let alone, can long withstand the accumulating supply.

Our correspondent has overlooked a very important consideration which has helped to sustain coal the present season. The severity of the last winter caused an extra consumption, which has been computed at fifty per cent. Great numbers, to guard against extortionate prices, obtained their winter's supply the last fall, contrary to their practice in former years. There is not, therefore, exhibited in the coal yards the quantity which, it would seem, might be required. Instead of being there as formerly, and in greater abundance, it is in the vaults of individuals. We believe at this moment the aggregate of coal in the yards and private vaults, will exceed the winter's consumption—especially if the winter continues as favorable as it has commenced.

Some have been alarmed because the coal mines have been alleged to be in a few hands, who have it in their power to perpetuate a monopoly. A very little knowledge of our country would satisfy them that a company might as well monopolize the land as the coal. As our correspondent says, new

mines are constantly making their appearance; and the positive indications of others are abundantly sufficient to quiet all apprehensions from monopoly. In no one thing has Providence been more bountiful to the United States, than in the article of coal. We may as well alarm ourselves at combinations to monopolize water or air. If our members of Congress, who are so distressed about the poor, will substitute for their repeal bill a bill for the appropriation of a sum equal to what the debate will cost, if it is entered upon—for the purpose of getting coal, to be sold to the poor at a fair price, they will manifest more sense, without diminishing at all the claims for our confidence in their sincerity.

The idea of those who would repeal the coal duty, to help relieve us from the admitted evils of our surplus revenue, will pardon us if we find their proposed remedy bordering on the ludicrous, inasmuch as the revenue from that source has not, in years past, averaged forty thousand dollars per annum!

If a proposition should be made to empty one of our lakes with ladels, it would not be more ridiculous. The time expended by Congress in hearing a dozen long-winded speeches, calculating the ordinary per diem cost, will operate much more effectually in this reduction, and would indeed afford the only argument we have ever heard in favor of the everlasting speeches, fashionable in the national school of rhetoric at Washington.

We will sum up what we have to say. Let the consumers of coal, eschew all petitions, keep up their courage, and be of good cheer, exercise rigid economy in the use of coal this winter, and we have no doubt but that the coming spring, the monopolists of coal will be sufficiently punished by a surplus that must remain a burthen to them until another season. The report on the Morris Canal, published in a former number, a document made up with great care, affords us the cheering information that by means of their canal, anthracite coal may be afforded for $3 66 per ton, and bituminous coal at $4 56—delivered in the city of New-York. As sure as cause and effect follow each other, the price must be soon reduced so as to afford to those engaged in it no more than a bare reasonable profit.

From the Genesee Farmer.

REPRODUCTIVE POWERS OF NATURE.

One of the most striking instances of design in the kingdom of Nature; and perhaps the one which most strongly marks the benevolence and wisdom of the Creator, so far as the lower orders of creation are concerned; is found in the astonishing multiplication of the inferior races of merely organized or vitalized beings, a fecundity which places the reproductive sources of nature in the clearest light.

Vegetables seem to have been expressly designed for the conversion of inorganic substances, such as the minerals, salts, water, and gases, into a material, fit for the support of a higher and more complicated race, which could not have subsisted on these primitive elements. The insensible grades by which the whole system of nature is marked, from the least distinctly organized vegetation, up through the insect and animal races to man, seems to prove that a more refined and delicate organization requires a corresponding difference in the nature and preparatory processes the food must have passed. As a necessary consequence the lowest classes, whether in a state of mere organization, or of vitality, should be the most numerous, and furnished with corresponding reproductive powers, a deduction in most cases, perfectly agreeing with the fact. The countless multitudes of the infusoriæ and medusæ, creatures that seem formed out of the water, and to derive their subsistence solely from it, furnish an illustration of this truth, as well as the whole vegetable race which receive their nourishment principally from the same source.

We have collected from various sources some instances of this reproductive power in the vegetable, insect, and animal departments of nature; instances which, illustrating as they do, the boundless resources of this part of the creation are worthy the attention of all.

Humboldt, from personal examination, in most cases, has estimated the productive power, or natural produce of wheat in various countries as follows:—in Germany and Poland six for one; in Hungary ten; in Great Britain 18; in the United States 16; in North Mexico 16; in equinoctial Mexico 24; in New Granada 30. Wheat however has in some instances produced 80 or 100 for one. Barley has given 130, and oats 140 for one. In England in 1824, a single grain of oats produced 19 stems, and 2945 grains. A single grain of wheat sown in a garden at Bath, in Sept., 1819, had in August, 1820, produced 73 stalks, and yielded 7445 grains. Mr. Miller, a distinguished gardener, by repeated subdivisions, obtained from a single seed of wheat 500 plants, which yielded 21,109 ears, and about 576,840 grains, weighing 47 pounds. In a poppy, 32,000 seeds have been counted; and a good bearing apple tree will produce from 30 to 50,000 seeds annually. Of trees, some species of elm produce seeds the most abundantly. A writer on Natural History, speaking of this tree, says,—"it has been calculated that one elm, in the course of its existence, has produced 1584 millions of seeds; and each of these seeds has the power of reproducing as many. At this ratio, the second generation, if every seed vegetated as prolifically, would amount to two trillions, 510,056 billions. But the third descent would be 14,658 quadrillions, 728,040 trillions. The seeds of this third generation from one elm, would be enough to stock the surface of all the planets in the system, and of many more." There is, however, no single vegetable which at once give birth to such an infinite number of seeds as some of the species of fungi or mushrooms. These are known by the name of *puff-balls*, and when ripe and dry, the seeds, or seminal principles, are thrown off in such multitudes as to resemble puffs of smoke. Fries and Lindsay have estimated the number from a single plant at not less than ten millions.

Insects are scarcely less prolific than vegetables. The numbers produced in a single year from some species is truly astonishing. The queen bee will lay in a season from six to ten thousand eggs.—The female of the termates or white ants of Africa, when about to found a colony, finds her abdomen enlarged to nearly two thousand times the rest of her body, and she continues to deposit her eggs in almost countless numbers, at the rate of about 70 a minute, or 100,000 in 24 hours. The number of her eggs in a season, has been estimated by some entomologists at upwards of thirty-three millions! When the female is in a gravid state, her size exceeds that of her husband by more than one thousand times. The myriads of caterpillars that sometimes show themselves on our forest and fruit trees, and the devastating millions of the locust, show this same facility of reproduction. The descendants of a single aphis or plant louse, will in a season amount to millions.

Fishes also exhibit the reproductive power of nature in a no less striking degree; and in their case the means of correctly estimating this power fortunately exists.—Mr. Harmar, an Englishman of science and perseverance, is the person to whom the world is indebted for the correction of Luenbroeck's exaggerated estimates. Mr. Harmer first weighed the roe of the respective fishes, with all possible accuracy, and then counted the eggs in a certain number of grains. A shrimp had 6,807 eggs; a perch 20,582; a smelt 30,991; a teuch 350,482; a roach 113,841; a mackerel 546,681; a flounder of 24 ounces weight 1,357,400; and a codfish 3,687,760.—Luenbroeck estimated the eggs in the roe of the last at nine millions. Some fishes bring forth their young alive. Of these the bleuny, not more than ten inches long, produces alive from 3 to 400 at a time.

A pretty fair manner of judging of the means of multiplication possessed by any part of creation is found in the numbers existing at the same time. According to this rule, birds will rank high in the scale of fecundity. Single instances which show this power are not wanting. A short time since, an English lady of rank took it into her head to hatch an egg in her bosom, and accomplished it successfully. The chicken proved to be a fine pullet, was much attached to its mistress, and in the course of two years furnished her with more than 300 eggs. The purple grackle or blackbird of this country, collects, as every one is aware, into flocks, amounting in the fall of the year to the number of fifty or a hundred thousand. The passenger, or common wild pigeon of the United States is another proof of the multitudes a season or two will produce. Wilson, one of the best authorities, in his great work on American birds, says, "of one of these immense flocks, let us attempt to calculate the numbers, as seen in passing from Frankfort to the Indiana territory. If we suppose this column to have been one mile in breadth, and I believe it to have been much more, and

that it moved at the rate of one mile a minute, four hours, the time it continued passing, would make the whole length 240 miles. Again, supposing that each square yard of this moving body contained three pigeons, the square yards multiplied by three, would give 2,230 millions, 272 thousand pigeons; an almost inconceivable multitude, yet probably far below the actual amount." The correctness of this last remark of Wilson's any one will apprehend, who has seen those immense breeding places of these birds, called roosts, in our forests; who has seen the trees for miles in distance literally loaded with nests; who has listened to the ceaseless din of their voices, and at the distance of miles heard the thunder of their millions of wings continually rising like the roar of many waters. A similar instance of the multitude of birds which will at times congregate together may be found in Hinder's voyage. The captain says, he saw "a stream of stormy petrels, which was from 50 to 80 yards deep, and 300 yards or more broad. The birds were not scattered, but flying as compactly as the free use of their wings would allow, and this stream of petrels for a full hour and a half, continued to pass without intermission, at a rate little inferior to the swiftest of the pigeon. Now taking the stratum at 50 yards deep by 390 in breadth, and that it moved at the rate of 30 miles an hour, and allowing nine cubic inches of space to each bird, the number would amount to 151 millions and a half."

As we ascend in the scale of creation and reach the maumalia and higher orders of quadrupeds, this power is less distinctly marked, though it is far from being extinct. As to be expected, however, it is found principally among the smaller animals, which are known at times and under favorable circumstances to multiply to a prodigious extent. The farmers of Western New-York have not forgotten the years when the forests were alive with squirrels, and the harvests suffered in consequence to an alarming degree. 95 years ago, when the population of Pennsylvania was but a cypher compared with its present amount, such were the ravages of the squirrel, that a reward was offered for their heads by the colonial government, and in a single year 640,000 were presented and paid for. The brown or Norway rat in half a century has overspread the world. It has produced 20 at a litter, and three times a year. At Gotha, north of the Baltic, they became a few years since such a nuisance, that the city offered a bounty for them, and in one year 80,000 were killed and paid for. On the Isle of France it has increased to such an extent as to threaten the entire destruction of the sugar cane, while birds were equally destructive to the rice. The government offered a bounty, and in a little more than half of the Island, in one month, 830,473 rats' tails, and 938,549 bird's heads were paid for. Rabbits breed so rapidly that in 4 years a single pair might be the ancestors of a million. The number of some kinds of animals taken care of by man may be inferred from the fact that Europe alone feeds more than 200 millions of sheep. The common ground mole in some seasons become destructively numerous.—In three weeks, on 16 acres, Buffon caught 1,300 moles; and a Dutch farmer in a single year, between five and six thousand.

Man, though far outdone in the powers of multiplication by the lower orders of creation, has not lost all traces of the reproductive energy of his nature. Of this the astonishing increase of the population of the United States is a sufficient proof, and of single instances we may refer to the peasant on the estate of Count Feodorff in Russia, who has been the father of ninety-two children, and to the Irish farmer, whose wife had presented him 43 children at 16 births. W. G.

From the Genesee Farmer

RESULTS OF EXPERIMENTS.

POTATOES, CARROTS, RUTA BAGA.

I have tried a few experiments on Potatoes, Carrots, and Ruta Baga this season, which I will state to you, and if you think any part of them will be of any benefit to my brother farmers, you can publish them.

No. 1. Planted whole potatoes, middling size, in drills, 3½ feet between the rows, and 6 to 8 inches in the row between the potatoes.

No. 2. Planted half ones, same distance between rows, and sets as above, and took one rod more in length than No. 1 for a bushel when dug.

No. 3. Planted midling sized potatoes, cut in six pieces, and three pieces put in a hill, three feet each way; six hills had forty-seven potatoes, weighing 10½ lbs.

No. 4. Planted the same size potatoes, cut once, and half put in hill; six hills had twenty-five potatoes; weight 10 lbs.

No. 5. Planted small whole potatoes, and six hills had sixty-four potatoes; weight 12 lbs.

No. 6. Planted with same sized potatoes and cut in two, and both pieces put in a hill, and six hills had sixty-eight potatoes; weight 12 lbs.

There was but a poor yield from any of my potatoes, and the difference in the hills weighed was continued through the whole rows in each case. My potatoes were injured by the drought, and I think if the season had been good, that No. 3 would have been better than No. 6, as there was a much greater number in a hill, and about of a uniform size.

I planted a few carrots in a field as an experiment, but they were planted three feet between the rows, (they should have been only one foot;) the yield was at the rate of 270 bushels per acre, and in the same field I had an acre of ruta baga, which only yielded 75 bushels, being entirely destoyed by the drought. I had a few carrots in my garden which yielded at the rate of 1600 bushels per acre. I am quite in favor of carrots as a field crop, provided the soil is deep. I dug them with a plough, turning out one row at a time and then following and cutting the top before ploughing the next row. The ground I planted had not any sand in it, and was naturally moist. I am trying an experiment with oil-meal, carrots, and ruta baga, to test their relative value as feed for milch cows. I may at some future time give you the results.

S. P. R.

Skeneateles, Jan. 9, 1837.

From the Baltimore Farmer and Gardener.

Agreeably to our intimation in the last number of our journal, we visited Mr. Beltzhoover's farm, situate about 2 miles from the city, to the right of the Frederick road, to view those of the cattle imported by Mr. Shepherd, that had been sent thither before we called down at his residence to see them, and were highly gratified.—They consisted of *five Durham Heifers*, one bull calf of the same breed, two Ayrshire heifers in calf, one calf of the same breed, and three fine English pigs.

Two of the Durham heifers, one a two year old, with her first calf, and a one year old, were very thin from the effects of their protracted voyage, but showed fine points. The two year old is a noble young animal, beautifully marked, red and white, of admirable proportions, displaying in an eminent degree the unerring indications of making a deep milker, and presenting in the whole the frame-work of a fine cow The yearling is nearly white, with a few red spots about the neck, and is a creature of large dimensions, being now, though so young and spare of flesh, nearly equal in size to most of our native cows. She is, we learn a great favorite with Mr. Shepherd's agent in England, and proceeds from a stock of much note, belonging to the late Mr. *Denton*, at the sale of whose effects she was purchased.

The other three Durham heifers are dark strawberry or mottled red, with white spots, and are fine models of their generous breed. The bull calf bought at the sale of the Rev. Mr. Berry's stock is a handsome red and white, and like his companions of the voyage, is every inch a Durham.

The two Ayrshire heifers have all the characteristic marks of their peculiar and excellent breed. They are in calf by an Ayrshire bull.

The three pigs of which we speak are fine young porkers. Two of them are white, the other of sandy-ground with black and white spots. The latter we think a Berkshire, and though a fine pig, cannot compare with the other two. Indeed, we do not know that we have ever seen any thing of the hog kind, that so pleased us as did the two white pigs. The *boar*, in particular, struck us as being a pre eminent specimen of his race, possessing a length of body, which is as round as a barrel, superior to any thing we have ever beheld of the same age. Mr. Shepherd's agent not having written him of what breed they were, only mentioning that they were the issue of a *prize sow*, he could not inform us upon that point; but let them trace their origin to what they may, they are as fine a pair of pigs as ever crossed the ocean, and we are sure that they are destined to contribute largely towards the improvement of our stock of hogs.

Although we were aware that Mr. Beltzhoover had an *establishment* in our vicinity, and from our knowledge of his character, enterprize, and becoming pride, we expected to see something fine, we confess we were not prepared to see one so perfect in all its appointments. It does most truly reflect great credit upon his public spirit and judgment. We shall not attempt here to describe it, because from the shortness of our visit, we feel incompetent to do it that justice which it merits, and will content ourself by observing that his cattle, his stables, and his every arrangement, bespeak at once a kind and well-judging proprietor.—We were highly gratified at the appearance of his milch cows, and by the bye, they are a noble set, their comfortable accommodation, the cleanliness and neatness of their stalls—and, indeed, we might say, that we were pleased with every thing except the *racks*, and these, we think, he should substitute by capacious mangers, and instead of feeding his hay *long*, that he should *cut* it; but the propriety, of this we shall leave to his better judgment—and as we intend, ere long to pay his establishment another visit, with a view of giving a more particular description of it, we will conclude this hasty paragraph by saying that he deserves great credit for what he has done.

We cannot, however, close this notice without observing, that the difference in the order of the heifer which calved on the passage, and those which were in calf, struck us most forcibly, and we think it worthy of mention—that no gentleman, who may contemplate an importation, should purchase a heifer or cow *near* calving, but should always choose those that are young in calf. No man can look on those imported by Mr. Shepherd, without at once seeing the propriety of our remark—while the young mother from the combined effects of the passage and the sucking of her calf, is greatly reduced in flesh; her associates, who stood beside her, are in fine heart, and look as if they had borne the buffets of the storm without materially being impaired in their condition.

AGRICULTURAL PAPERS IN MAINE.

Maine can now boast of a trio of agricultural papers, equal to any in the country; and we are happy to add that her farmers seem to understand their value, by tendering them a hearty and liberal support.

The Maine Farmer, is published at Winthrop, and ably conducted by Dr. Holmes, a practical cultivator, and a scientific man. His correspondents are numerous and of the right sort, giving valuable statements of improvement and experience, in a plain and perspicuous manner.

The Yankee Farmer, is published at Portland, S. W. Cole, Editor, and commences its third volume, with an improved typographical appearance, and changed from a semi-monthly to a weekly paper. The Editor is industrious, and successful in his endeavors to present to his readers an interesting sheet. The selections and editorial matter are alike judicious.

The Farmer and Mechanic, John S. Sayward, Editor, published at Bangor, is devoted as its name indicates, and differs somewhat in plan from the two first named papers, but no less useful or interesting.

Though the establishing of these papers has had the effect to withdraw subscribers who live in that section, and who very properly preferred to subscribe for local papers, from our list, we gladly hail them, and wish them all the prosperity they deserve.—[N. E. Farmer.]

LARGE HOGS.

Big Hogs.—David Smith, of Hadley, has slain five hogs, the whole weight of which exceeded twenty-one hundred! One fellow had grown so corpulent about the face that, literally he could'nt look "beyond his eyelids!"—[Northampton Courier.]

Mr. Cornelius Husted, of Pine Plains, in this county, fattened this fall, a "lady pig" and 11 "blooming responsibilities," the weight of which was twenty-four hundred and thirty-seven pounds! If Northampton can produce a swinish family having more *weight* in community than this, we will give it up, and say nothing about one of our Duchess county pigs, which had grown so fat, that—would you believe it?—his mother did'nt know him!—[Poughkeepsie Tel.]

Larger Still.—Messrs. Editors,—In order to sustain the credit of old Duchess, I enclose you the weight of 11 hogs, which I sold to Mr. Eli Mygatt, merchaut of New Bedford. Their weight was as follows: 300, 352, 384, 387, 391, 400, 448, 453, 459, 496. Aggregate weight 4,542 pounds; average weight 413 pounds. The hogs were 1 year old in June last.—Albro Akin.

Quaker Hill, Dec. 26, 1836.—[Ibid.]

There were yesterday brought to this market, by Mr. Nathaniel Brown of Scituate, nine hogs, raised by him the present season, weighing in the aggregate after being dressed 3,443 lbs., averaging a fraction less than 383 pounds each. The largest weighed 460 pounds. They were purchased by Messrs. Ward & Work, and J. Floret, of the Old market.—[Prov. Jour.]

We have given above the utmost that Hadley, "Old Duchess," or Scituate can boast of, and now give them a touch of what Southboro' can do.

Large Hogs.—Joseph Jennison, of Southboro', Mass. has fatted and brought to market this season, two Hogs 18 months old, weighing 629 lbs., and 557 lbs., which he sold for 13 cents a pound, realizing the sum of $154 18. Pretty fair business this!—[New E. Farmer.]

From the Farmers' Register.

OBSERVATIONS MADE DURING AN EXCURSION TO THE DISMAL SWAMP.

BY THE EDITOR.

The following article from the Farmers' Register, will be found highly interesting.

Whoever has heard any description, however slight and imperfect, of the great morass known by the name of the Dismal Swamp, must have been interested and impressed by the peculiar features and remarkable circumstances mentioned. Yet few persons have made any personal observation of, or paid much attention to these things, except those whose near residence, and early and long continued business and habits of life, have made them so familiar with the swamp, that they have lost, or perhaps never enjoyed, the freshness of feeling which novelty would have excited. Persons thus long acquainted with the ground, do not seem to think its circumstances very remarkable, and therefore do not offer their information to strangers. On the other hand, strangers, who at least might learn the facts thus acquired by residents, do not even direct inquiries so as to draw them forth, because totally ignorant of their interest, and even existence. Few strangers would ever have been induced by curiosity to attempt the great labors necessary for even a slight examination; nor would any have probably seen more than some points on the outer margin, but for the great highways now opened through the swamp—the great canal, the road on its bank, from Norfolk to North Carolina, and the railway which dips into the northern extremity of the swamp. These passages have given to thousands a rapid passing glance at certain portions of the scenery: but in every other respect, these numerous passengers have added nothing to the scant information previously possessed by the public. No visiter has made the investigation of the peculiarities of this unknown land a main object—and still less has any person paid attention to the geological and agricultural aspects in which this region well deserves consideration. I am but little qualified, either by scientific acquirements, or by opportunity for personal investigation, to supply these deficiences. Still, in the absence of better digested and more accurate information, I will now offer such facts as were learned or observed, during a recent hurried visit to the Dismal Swamp, together with the speculations that these facts and observations suggested to my mind. Under circumstances so unfavorable for careful or full investigation, it is not probable that mistakes can be avoided. But I am willing to hazard being found in error, in the hope that the needed corrections may be furnished, and more full as well as correct information be given, by others better acquainted with the localities.

The part of the Dismal Swamp lying in Virginia, is about 25 miles from east to west, and about 20 from north to south—that is from near Suffolk to the Carolina line. The swamp stretches perhaps 20 miles more southward within North Carolina, but with much contracted width, and limits not well defined on maps, or by report. With such minor variations as will be mentioned hereafter, the whole of this extensive region is one great morass, or quagmire, except for the partial firmness caused by its cover of vegetables, and their matted roots. It would be naturally supposed that the swamp was much lower than all the surrounding lands, and the general receptacle of the numerous streams flowing from them. But, on the contrary, the swamp is higher than nearly all the firm and dry lands that encompass it, and the interior of the swamp is generally higher than the outer parts. The only exception to both these statements is found on

Although we were aware that Mr. Beltzhoover had an *establishment* in our vicinity, and from our knowledge of his character, enterprize, and becoming pride, we expected to see something fine, we confess we were not prepared to see one so perfect in all its appointments. It does most truly reflect great credit upon his public spirit and judgment. We shall not attempt here to describe it, because from the shortness of our visit, we feel incompetent to do it that justice which it merits, and will content ourself by observing that his cattle, his stables, and his every arrangement, bespeak at once a kind and well-judging proprietor.—We were highly gratified at the appearance of his milch cows, and by the bye, they are a noble set, their comfortable accommodation, the cleanliness and neatness of their stalls—and, indeed, we might say, that we were pleased with every thing except the *racks*, and these, we think, he should substitute by capacious mangers, and instead of feeding his hay *long*, that he should *cut* it; but the propriety, of this we shall leave to his better judgment—and as we intend, ere long to pay his establishment another visit, with a view of giving a more particular description of it, we will conclude this hasty paragraph by saying that he deserves great credit for what he has done.

We cannot, however, close this notice without observing, that the difference in the order of the heifer which calved on the passage, and those which were in calf, struck us most forcibly, and we think it worthy of mention—that no gentleman, who may contemplate an importation, should purchase a heifer or cow *near* calving, but should always choose those that are young in calf. No man can look on those imported by Mr. Shepherd, without at once seeing the propriety of our remark—while the young mother from the combined effects of the passage and the sucking of her calf, is greatly reduced in flesh; her associates, who stood beside her, are in fine heart, and look as if they had borne the buffets of the storm without materially being impaired in their condition.

AGRICULTURAL PAPERS IN MAINE.

Maine can now boast of a trio of agricultural papers, equal to any in the country; and we are happy to add that her farmers seem to understand their value, by tendering them a hearty and liberal support.

The Maine Farmer, is published at Winthrop, and ably conducted by Dr. Holmes, a practical cultivator, and a scientific man. His correspondents are numerous and of the right sort, giving valuable statements of improvement and experience, in a plain and perspicuous manner.

The Yankee Farmer, is published at Portland, S. W. Cole, Editor, and commences its third volume, with an improved typographical appearance, and changed from a semi-monthly to a weekly paper. The Editor is industrious, and successful in his endeavors to present to his readers an interesting sheet. The selections and editorial matter are alike judicious.

The Farmer and Mechanic, John S. Sayward, Editor, published at Bangor, is devoted as its name indicates, and differs somewhat in plan from the two first named papers, but no less useful or interesting.

Though the establishing of these papers has had the effect to withdraw subscribers who live in that section, and who very properly preferred to subscribe for local papers, from our list, we gladly hail them, and wish them all the prosperity they deserve.—[N. E. Farmer.]

LARGE HOGS.

Big Hogs.—David Smith, of Hadley, has slain five hogs, the whole weight of which exceeded twenty-one hundred! One fellow had grown so corpulent about the face that, literally he could'nt look "beyond his eyelids!"—[Northampton Courier.]

Mr. Cornelius Husted, of Pine Plains, in this county, fattened this fall, a "lady pig" and 11 "blooming responsibilities," the weight of which was twenty-four hundred and thirty-seven pounds! If Northampton can produce a swinish family having more *weight* in community than this, we will give it up, and say nothing about one of our Duchess county pigs, which had grown so fat, that—would you believe it?—his mother did'nt know him!—[Poughkeepsie Tel.]

Larger Still.—Messrs. Editors,—In order to sustain the credit of old Duchess, I enclose you the weight of 11 hogs, which I sold to Mr. Eli Mygatt, merchant of New Bedford. Their weight was as follows: 360, 352, 384, 387, 391, 400, 448, 453, 459, 496. Aggregate weight 4,542 pounds; average weight 413 pounds. The hogs were 1 year old in June last.—Albro Akin.

Quaker Hill, Dec. 26, 1836.—[Ibid.]

There were yesterday brought to this market, by Mr. Nathaniel Brown of Scituate, nine hogs, raised by him the present season, weighing in the aggregate after being dressed 3,443 lbs., averaging a fraction less than 383 pounds each. The largest weighed 460 pounds. They were purchased by Messrs. Ward & Work, and J. Floret, of the Old market.—[Prov. Jour.]

We have given above the utmost that Hadley, "Old Duchess," or Scituate can boast of, and now give them a touch of what Southboro' can do.

Large Hogs.—Joseph Jennison, of Southboro', Mass. has fatted and brought to market this season, two Hogs 18 months old, weighing 629 lbs., and 557 lbs., which he sold for 13 cents a pound, realizing the sum of $154 18. Pretty fair business this!—[New E. Farmer.]

From the Farmers' Register.

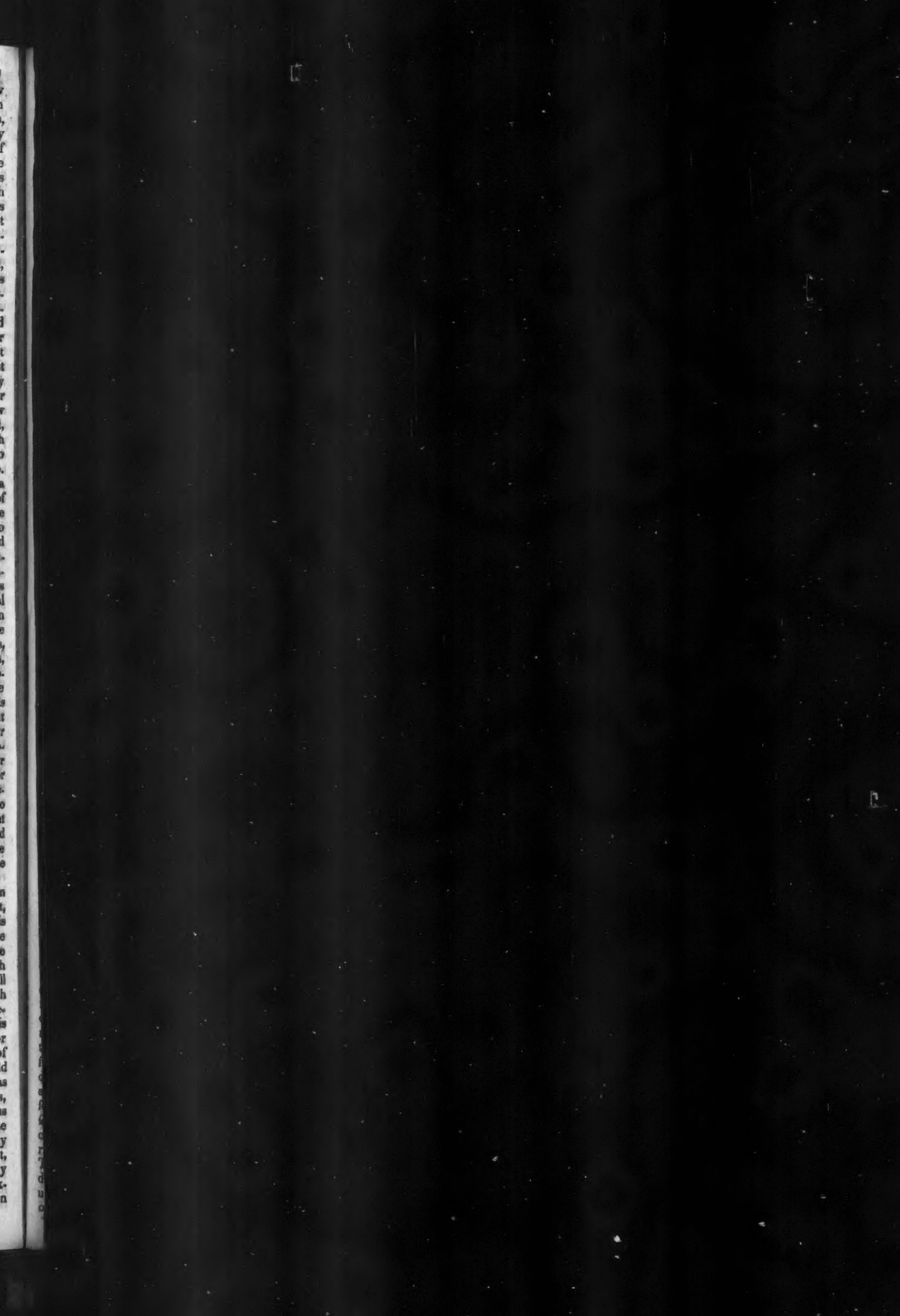
OBSERVATIONS MADE DURING AN EXCURSION TO THE DISMAL SWAMP.

BY THE EDITOR.

The following article from the Farmers' Register, will be found highly interesting.

Whoever has heard any description, however slight and imperfect, of the great morass known by the name of the Dismal Swamp, must have been interested and impressed by the peculiar features and remarkable circumstances mentioned. Yet few persons have made any personal observation of, or paid much attention to these things, except those whose near residence, and early and long continued business and habits of life, have made them so familiar with the swamp, that they have lost, or perhaps never enjoyed, the freshness of feeling which novelty would have excited. Persons thus long acquainted with the ground, do not seem to think its circumstances very remarkable, and therefore do not offer their information to strangers. On the other hand, strangers, who at least might learn the facts thus acquired by residents, do not even direct inquiries so as to draw them forth, because totally ignorant of their interest, and even existence. Few strangers would ever have been induced by curiosity to attempt the great labors necessary for even a slight examination; nor would any have probably seen more than some points on the outer margin, but for the great highways now opened through the swamp—the great canal, the road on its bank, from Norfolk to North Carolina, and the railway which dips into the northern extremity of the swamp. These passages have given to thousands a rapid passing glance at certain portions of the scenery: but in every other respect, these numerous passengers have added nothing to the scant information previously possessed by the public. No visiter has made the investigation of the peculiarities of this unknown land a main object—and still less has any person paid attention to the geological and agricultural aspects in which this region well deserves consideration. I am but little qualified, either by scientific acquirements, or by opportunity for personal investigation, to supply these deficiences. Still, in the absence of better digested and more accurate information, I will now offer such facts as were learned or observed, during a recent hurried visit to the Dismal Swamp, together with the speculations that these facts and observations suggested to my mind. Under circumstances so unfavorable for careful or full investigation, it is not probable that mistakes can be avoided. But I am willing to hazard being found in error, in the hope that the needed corrections may be furnished, and more full as well as correct information be given, by others better acquainted with the localities.

The part of the Dismal Swamp lying in Virginia, is about 25 miles from east to west, and about 20 from north to south—that is from near Suffolk to the Carolina line. The swamp stretches perhaps 20 miles more southward within North Carolina, but with much contracted width, and limits not well defined on maps, or by report. With such minor variations as will be mentioned hereafter, the whole of this extensive region is one great morass, or quagmire, except for the partial firmness caused by its cover of vegetables, and their matted roots. It would be naturally supposed that the swamp was much lower than all the surrounding lands, and the general receptacle of the numerous streams flowing from them. But, on the contrary, the swamp is higher than nearly all the firm and dry lands that encompass it, and the interior of the swamp is generally higher than the outer parts. The only exception to both these statements is found on



the western side, where for some distance, say 12 or 15 miles, the streams flow from higher land into the swamp, and supply al its abundant and overflowing water. But towards the north, east and south, the waters flow from the swamp to different rivers, and give abundant evidence, by their courses and their rate of descent, of the swamp being higher than the surrounding drier and firm ground. I do not mean that, at the junction of the two, the swampy ground is highest. On the contrary, it is generally bordered by a flat ridge of land perceptibly, though very little higher: but this ridge slopes downward on all sides except the west, and soon descends to a level greatly below the general surface of the swamp. The accurately levelled profile of the railway from Portsmouth to Suffolk, and of the Dismal Swamp Canal, and the Land Company's Canal, all furnish still stronger and more accurate evidences of the general fact stated. The railway passes through about 4 miles of the northern extremity of the swamp—and is there higher than when on the firm land some miles away on either side; and is 6 to 7 feet higher than on firm and dry ground near to Suffolk and to Portsmouth. The central part of the swamp is 5 or 6 feet above the middle section of the Dismal Swamp Canal, which section is some 13 feet above the rivers into which it empties at both ends—and these rivers are not more than 5 or 6 feet below much of the dry but low-lying land of this generally flat country. If it could be supposed that the streams, which flow into the western part of the present swamp, had for ages been bringing, not water, but mire almost as fluid as water, the spreading of that mire over the basin of firm subsoil, which now underlies the swamp, would have caused nearly such slopes, and form of the surface, as now exist—descending from the issuing streams on the west to the centre of the area, and thence descending towards every other part of the circumference. The surrounding slightly elevated rim, and various small and narrow ridges of poor and firm land, which rise like low islands in various places above the surface of the swamp, and the gradually descending slopes from such summits under the adjacent swamp soil, all give countenance to the supposition that the swamp is a comparatively recent formation or deposite on the lower foundation.

But whence came this enormous deposite of 25 miles in width, and in many parts 10 to 15 feet in thickness? The flood of liquid mire, which was supposed above for the purpose of illustration, of course was impossible Neither could the deposite have been made by the alluvium of the streams —because they bring down very little, and because the soil of the swamp is not such as would be formed by such a cause. It is not principally *earthy*—as are all alluvial deposites, of every grade of fertility and consistence—but *vegetable*—and this peculiar and regular constitution may point out the origin, and explain the growth, of this vast body of high morass.

Before seeing the Dismal Swamp, and making some examination of its differen soils, I had always considered that no true peat soil existed in Virginia—and that it could not form, nor remain long, if already formed, owing to the warmth and length of our summers, and the consequent ease with which vegetable matters runs into fermentation and putrefaction. I have several times incidentally expressed this opinion in different publications, and the last time, but a few days before visiting this region. (Far. Reg. p. 504 vol. IV.) I still hold this opinion, as to all common lands and localities, and in circumstances similar to those in which most peat mosses exist in Europe. But the Dismal Swamp is certainly a peat soil, or soil formed almost exclusively of vegetable matter, though the kinds of plants, and the manner of the formation, may differ much from European peat. In Scotland, the climate is so damp, and the summers are so short and cool, that in many situations, the natural vegetation of one year, if left undisturbed, will not rot during the next; and it remains, either wholly or principally. adding to the height of the surface soil, without giving it any increase of fertility. If water flows into such land, it is absorbed by the vegetable matter, and acts to give greater vigor to growing mosses, and other aquatic plants, and still more to retard their putrefaction when dead. Thus, in the situations most favorable to the formation, that is the coldest and most moist, (witkout being overflowed by water,) the peat grows to many feet in depth—and even on pasture lands, or arable left untilled, the surface becomes peaty or moory, having an excess of vegetable matter, but in that undecomposed state which makes a soil less, instead of more productive under tillage. Hence, the peats of Britian, whether of 6 inches or 6 yards deep, are barren, or at least tending to make a soil unproductive: and when brought under tillage, besides drainage, these soils require operations to decompose their excess of vegetable matter, to fit them for producing grain crops. For this purpose, the dry and shallow peats are pared and burnt—and the deep peats are limed, dug up and stirred, and even manured with dung, to quicken fermentation. Now no such formation of soil can take place in such a climate as ours, because the summer's heat and continuance are more than sufficient, under ordinary circumstances, to ferment all the vegetable matter that the preceding year had produced. Paring and burning the soil, which is a common and excellent part of preparatory tillage in England, on any common highland soils that have been left in pasture, could not be effected in Virginia—and if it could, would be injurious, by destroying the vegetable matter, which, if not burnt, would be decomposed soon enough.

It is true that we have soils as entirely of vegetable formation as many of the peats of Britain. Such are all the fresh water tide marshes, parts of many swamps and the whole of the great Dismal Swamp But the difference I take to be this The vegetable soils, being kept constantly either covered by, or saturated with water, are kept from entirely rotting, and are increased in thickness by annual accessions o vegetables. But though not enough rotted to lose much of the bulk, they are enough so to form manure: and these lands need only perfect draining to be at once highly fertile. Then indeed the soil begins to rot too rapidly; and if kept dry, will continue to rot as long as a great excess of vegetable matter remains. Hence the opinion which I have long maintained by reasoning, and to my very great loss have seen proved in practice, that our fresh water tide marshes, if diked and drained, will rot away, as deep as they are made dry enough for tillage.

The soils of the Dismal Swamp are much nearer to the peat of Europe than any other that I have observed: indeed the upper layers of the juniper lands, to the depth of some inches, may be formed of the same mosses. But below the living roots, though still it is all of vegetable formation, the plants are so rotted they are simply a soft black mud. The general cover of all this kind of ground, under the shelter of the large trees, shrubs, or reeds, is a thick carpet of tender mossy plants, which rise to 4 or 5 inches high, and which are taken up by the hand so easily, that they seem to have scarcely any hold of the ground. Where these grow, the surface is as wet as water can make it, if not covered an inch or two. This, the least solid of the whole, is the soil most favorable to the juniper trees—which stand, barely supported by the long tap root, in these quaking bogs of "surf" or "sponge," as this earth is called by the laborers.

The peat of Europe, or at least certain qualities of it, is good fuel: and I have but lately learned from a very intelligent gentlemen who resided in Boston during the late war with England, that the peat of Massachusetts was then used for fuel, in consequence of the scarcity and high price of coal. In an article in a New England paper which has since reached me, I see the use of the same fuel recommended at this time. The vegetable soil of the Dismal Swamp, (like that of our tide marshed,) when dry, is highly combustible—and being principally of vegetable origin, would leave but little ashes, or earthly residue. But on account of being so well rotted, it would probably make but poor fuel.

The immense and continually growing fields of peat, which are spread over the earth in cold countries, are probably the materials for future beds of coal, after being buried deep in the earth by some of the convulsions of Nature which have so often changed the face of the globe. When compressed by the weight of mountains to the density of stone, the peat of the most open texture, or the most rotted and worthless, may become a coal valuable for fuel. I do not believe that geologists admit this theory of the formation of coal: but it seems to me a more plusible origin than from other than peaty matter.

It is not difficult to conceive how the soil of the Dismal Swamp should have been growing in thickness, and spreading over more extent of surface; and that it shall continue to do both, if the existing causes are suffered to operate. The streams which flow from the western highland are sucked up by the earth, which from the nature of its composition, absorbs and holds

water like a sponge: and it is thus filled or very slightly overflowed by water, and yet no part covered deeply, because the superfluous water finds or forms channels to escape into rivers, which head at various adjacent and much lower points. This continual wetness, and the extreme richness of the soil, combine to produce a prodigious growth of aquatic plants, of various kinds, and of all sizes, from the diminutive moss to the gigantic cypress. The wet soil causes more evaporation than would take place from water alone—and evaporation causes cold—and the heat of the sun is in great measure excluded by the thick cover of trees. Hence, a coldness of the earth, suitable to a far more northern climate is produced, and maintained. The leaves and moss, and other vegetable matters that fall, are but partially decomposed, and thus add annually to the thickness of the soil.

As might be inferred from the operation of the causes named, but little of the surface of the swamp is many inches either above or below the water, though the level of the swamp is in some places five feet lower than in others, and perhaps much more. Standing, but shallow water tends to raise the earth to its surface: and if, by drainage, drought, or any other circumstance, a part of the land should be so much higher than the water as to become quite dry, the first accidental fire would reduce it to a lower level.

It may well be supposed, from the foregoing general description, that the swamp furnishes very difficult ground to travel upon. But I had no adequate conception of the magnitude of the difficulties before personally making the trial. In addition to the general wetness of the earth—the most dry being a mire, from sinking in which the traveller is guarded only by the mat of living roots—the undergrowth of evergreen shrubs, and vines or reeds, cause still greater impediments to his progress.

It is difficult to imagine a sufficient motive to have induced any man to penetrate a mile into the swamp, before paths were cut and made solid enough, for the purpose of getting the timber. And these obstacles long prevented any person from going far from the borders. It was as late as some twenty years before the revolutionary war, that the lake, which is the most beautiful and magnificent feature of the region, was first discovered by a hunter, named Drummond, who had lost his way, and therefore wandered miles through this "Slough of Despond." He could not have reached the lake in the shortest line from the main land in less than three miles—and probably it was many more. What must have been the sensations of a man, so lost in such a gloomy labyrinth, when he came suddenly upon the border of this splendid sheet of wide water! Lake Drummond is nearly oval—seven miles long, and more than five wide. It has no beach, the thick and tall forest being at and in its margin. The water is generally even with; and often gently overflowing its banks—and the banks (if such they may be called) sink perpendicularly, so that whether the waters of the lake are higher or lower than is usual, it makes no difference in the breadth of the water, and but little difference in the general appearance of the shores. There may be a difference between the highest and lowest water, from the opposite effects of the wettest and dryest seasons, of three or four feet—and there would not be as much, perhaps, but for the artificial reducing of the water, in the dryest seasons, to supply the great canal for the purposes of navigation.

This beautiful lake—and which no doubt seems the more beautiful on account of the gloomy scenery passed to reach its borders; is so much like belonging to fairy land, that it is not strange that it should have been connected with sundry popular delusions.—Some persons at first had affirmed, and others believed, that the lake had no bottom, or that it communicated with the neighboring ocean by a subterraneous passage.—There was but slender ground for this delusion, as the lake is quite shallow, and the level of the bottom very regular. Mr. Mills Riddick sen. of Suffolk, told me that he assisted Commodore Barron in sounding across the lake. The depth about the middle, where greatest, was 15 feet. The bottom is of mud like the swamp, but sometimes a pure white sand colors the mud a foot, or perhaps more, in depth.

About the time that the lake was discovered, another event took place which produced ultimately the present proprietary state, and peculiar business and management of the swamp. This was the "taking up" by Gen. Washington, and a few other gentlemen acting upon his suggestion, of all the then unappropriated lands of the Dismal Swamp in Virginia. Before that time no persons had taken possession (by course of law,) of any lands, but those at and near the margin of the high land, because the interior lands were not deemed worth paying the lowest taxes on. Gen. Washington whose business as a land surveyor gave him many opportunities of acquiring possession of valuable public lands, and who obtained much of his wealth in that manner—saw a rich farm on the border, which had been rendered productive by being drained. Thinking that the whole swamp was equally available for cultivation, he formed the association above named, bought the farm in question, and took up all the remaining State lands, estimated then at 40,000 acres, but which are now supposed to be much more. They excluded the lake from their patent, though it was completely surrounded by their land, considering it not worth paying a tax for.—By this ill judged economy the company has since suffered. When the Dismal Swamp Canal Company was afterwards chartered, they were granted by the commonwealth the exclusive use of the water of Lake Drummond to feed their canal—and this grant serves to shackle the efforts of the Land Company, (since also incorporated,) and would prevent the adoption of any general plan for draining. As is usually the case with corporations that come in contact, they seem more fond of squabbling with and opposing each other, than of uniting in any general procedure for the good of both.

The only object of the Land Company at first were agricultural—and they commenced and for years carried on tillage on their farm, and drainage to extend it. For the latter purpose, they dug a canal of some miles in length from the high land to the lake, which is still large enough for the passage of boats. This is now known as the "Washington Ditch." But whether their plans were judicious, or had the defects inherent in such joint stock companies, their labor and capital yielded little profit. The war soon followed, and before its end half their slaves went off to the enemy, as was generally the case in places so near their encampment.—After peace was made, the work still went on badly, until the Company undertook the getting of juniper shingles. This business, which was not at first counted on, has since become their sole pursuit, and immensely profitable, and must continue profitable until the timber is mostly consumed, which indeed is rapidly approaching completion. The shares into which the stock was originally divided, have increased in price from $3000 each to more than $15,000; and the dividends made are large even for the highest price. But unlike most other stocks, this is diminishing in real value, with every year's waste of timber—and unless the land itself is made of value by drainage, the stock of this rich company will, at some future time, lose its market value, as rapidly and to many owners as unexpedly, as it was formerly acquired.

What I have stated of the Land Company, was learned from gentlemen who have been long and well acquainted with the general affairs of the company; but as their knowledge was not official, and rested on memory, facts may have been incorrectly stated as to dates, amounts, or other minor circumstances.

It had long been my intention to visit these scenes—but it was only very lately that a first and hasty visit was made, which has enabled me to judge of and to describe them, as far as will here appear.

On Nov. 17th, I reached Suffolk by way of the railway, from Portsmouth, which passes through a few miles of the swamp at its northern extremity, and thus permitted a first slight glance. It seems unfortunate that the first approach to the swamp, of almost every person hereafter, will be on the rapidly moving railway train. The savage gloom of the face of nature is altogether unsuited to the highly artificial facilities by means of which the traveller is flying past—and the discordance serves to lessen the high gratification which either the conveyance or the scene alone would cause, when new to the observer.

It was too late on that day to commence a voyage to the lake—nor could it be made on the next: for though every thing else necessary had been carefully provided, there were no good boatmen out of the swamp—and without those accustomed to the peculiar mode of navigating the canal, there was no getting on. The leisure afforded by these disappointments permitted me to visit some of the most interesting lands in the neighborhood—and to see some improvements on swamp lands, to which my remarks will now be confined. Having mounted on horseback, we returned by a different route, to the swamp where it is crossed by the railway.

This great public improvement had effected much of the first and heaviest labor necessary for draining the adjacent swamp lands, and had clearly indicated the proper mode to pursue—and the proprietor on one side, Mr. David Jordan, was making proper use of the opportunities thus offered. The swamp land here is 6 to 7 feet higher than the part of Suffolk which the railway passes over; and the ditches dug on each side, to drain and to raise the track of the road, furnish deep and wide discharging outlets, to receive the waters from all smaller ones draining from the swamp. This land had been filled or covered with water before the railway was begun: the ditches dug by Mr. Jordan, are at right angles to the road, and emptying as above stated, have laid the land dry, and kept the water as much below the surface as the depth of his ditches, which is from 2 to 2½ feet. Still this is not enough for so spongy a soil, which will draw much moisture upward, and from considerable depths. I advised giving 10 or 12 inches more of depth to the smaller ditches, and still more to the large railroad ditch, which can be easily done. The water comes from the general overflowing or saturation of the swamp, and therefore a good large ditch ought to surround the whole piece designed to be reclaimed.

This tract of land was bought by Mr. Jordan and Mr. Benton, after the railway was made, at $7.50 the acre. Immediately adjoining, and also on the road, another body of land of 2000 acres had been bought before the road was commenced, for only $900. a most striking evidence of value thus increased. All the wood is now made marketable, and is cut to a great profit, and sent by the train to Portsmouth. It is cut (by the job) into 4 feet lengths, at 50 cents the cord; carted and corded along side the road for 25 cents more—(and this expense might be lessened one-half, by making branch wooden railways—) and the wood is sold at $1.25 in that situation, and now commands $4 if delivered in Portsmouth. As but little superintendence is required, the profit from an acre must be very considerable.

The swamp soil next the railway was from 1½ to 2 feet thick, resting on a good dark colored clay. The soil did not appear to vary materially in texture, as seen in the new ditches several hundred yards towards the interior. It is of the more firm and earthy kind, known as "gum swamp," but which seems to be composed in great measure of vegetable matter. It appears precisely like the soil of the gum and ash tide swamps on James River. Farther from the railroad, the ditch reached land which formerly had been burnt over, so as to destroy its trees, and it was now covered by the closest possible growth of reeds, among which were scattered many young pines. The soil did not seem to change, otherwise than by becoming deeper. The sub-soil here is a stiff yellowish clay.

Early on the morning of Nov. 19, our party assembled at the northern end of the Land Company's Canal, about a mile from Suffolk. To this point all their shingles are brought by boats—and passed over to the tide creek close by, and which is about 20 feet lower in level, where they are received by vessels which carry them to the northern cities. Our party was mostly composed of gentlemen of Suffolk, who most kindly aided all my views and wishes. The boat was flat bottomed, long and spacious, belonging to the Land Company, and designed solely for conveying passengers in trips to the lake, for pleasure or business. It was well suited for the purpose, and was well manned and provided for this occasion.—The mode of propelling the boat is the same as is always used for the shingle boats. A strong pole is fastened across the square head, and another in like manner at the stern, at right angles to the boat, the other ends extending across the tow-path on the margin of the canal. By these poles the men push the boat along in a rapid walk, and at the same time lean on them so as very much to lighten their labor. Four experienced hands accompanied our boat, who relieved each other from time to time. It seemed strange to me that horse power had not been substituted for that of man for this business; for though it would be costly to provide enough solid earth to make a tow-path for horses, when once done, one horse would pull as many boats as perhaps 15 or 20 men could shove.

This canal was dug 12 feet wide, 4 feet deep, and is 10 miles in length, and very nearly straight. Its water is almost a level—a gentle current flowing from the middle part towards each end. The firm land soon was passed through—(in which the banks are from 1 to 2, and for a short space 3 to 4 feet high—) and we then entered the swamp. The tow-path still continued to be a firm but low bank for a short space more—and then for the remaining 7 or 8 miles was scarcely above the surface of the adjoining swamp, and merely afforded better footing by being trodden, and thereby consolidated, and by the poles and other wood placed along where water covered the ground for the boatsmen's steps. The earth thrown out in digging the canal must have made on each side a wide and high bank. But so little elevation now remains, that it furnishes alone sufficient proof of the correctness of my previous opinion, that such land, if kept dry, will rot away, leaving nothing but the very small portion of earthy matter in the soil. A permanent horse towpath could therefore only be made by earth boated from the firm land, or by wood. Wooden roads for mules are made throughout the swamp, to convey the shingles to the borders of the canal, or lake—and these roads are so rough, and bad, that it seems as if as much power must be lost on them, as by using hand labor to propel the loaded boats. Some of these roads are 5 or 6 miles in length—and their united length must be very great. They are constructed as follows. Double lines of poles are laid in the direction of the road, about the distance apart of the cart wheels. Across these are laid split pieces, merely long enough for a single track of a cart, of 4 to 6 inches in diameter, and as angular and irregular as may be supposed, from mauling. These lie close to each other across the sleepers, and present a very rough and unstable surface for the wheels, and still worse for the feet of the mules. Still, I was told that on such roads, a mule will draw as heavy a load as on ordinary roads, on land. If so, it would seem that they would draw ten times as much on smooth longitudinal tracks, or such wooden rail, or tram-roads, as are described in Vol. I. of the Farmers' Register.

The escape of the water in numerous places over the margin of the canal, served to explain how there could be a regular current always setting towards the *closed* end of a level canal.

We soon reached juniper trees, (or white cedars) and the softest swamp soil, in which situation only, these trees grow. I had never before seen a juniper—and should not now have distinguished them from the red or true cedars, but for their situation, greater height, and the beautiful straightness of their long naked trunks. The length of the branches, and the spreading and bulk of the whole top, bear but small proportion to the diameter and length of the trunks of the juniper. The trees are beautiful, and especially when they stand thick, forming a high roof of their evergreen tops, supported by numerous columns formed by their long and straight stems. They are not often large, or are too valuable as timber to be permitted to reach much size. Most of our whole course was through the "burnt woods," a large track of which nearly all the growing trees had been formerly killed and consumed by great fires in former times.

Though the form of the juniper is well adapted to stand on its soft and yielding foundation of mire, still when large it is easily overthrown by winds—and perhaps as many such were lying beneath the surface of the peat, as were standing erect. When thrown down, they are soon covered by water, and keeping wet, they never rot, except the sap wood, which is less than an inch thick. Much of the timber now got, is from trees long covered a foot or two deep under the surface soil, and which are found by the workmen by sounding, and then dug to and sawn off into shingle cuts, though half covered by water. Some of the great fires, in certain places, have brought to view and into use, more good timber than they injured, by burning the soil down to where numerous trees had lain perhaps for a century concealed, and their existence unsuspected. By the way—in digging down into the swamp, charcoal, the plain evidence of the former fires, and of the height at which the surface had then stood, is often found at several feet below the present surface—thus giving practical proof of the growth of the soil in thickness by the operation of the natural causes before reasoned from. But I get on slowly upon the canal.

The canal, when perfectly straight for a long course, with the trees on each side almost joining their branches across, presents a beautiful vista and perspective view—and with our singular boat and its equipage would have furnished a fine subject for a painter. Still more striking were the same scenes when we returned at night, with the bright light of our fire partially displacing the general darkness. The landscape painter would find many new subjects in this region, where every thing is strange and new—and so might the student of botany and other branches of natural history. A writer like Irving might here find enough interesting matter for description and narrative, to fill a volume. The land and the water—the ve-

getables and the wild animals—the inhabitants in their habits and occupations—are al as different from the surrounding country as if the traveller had suddenly passed into a far remote region.

I landed several times in the course of the day, at places of different appearance and growth, and of different levels, and walked far enough to see the swamp in all its various conditions. The parts most easy to walk through (and these are scarely passable) are where the original gigantic forest growth has not been destroyed or hurt by fire, or where the reeds, forming a thick growth, have all died, and thus permited one, with some effort, to break his way through such a brittle though close barricade. The getting of timber being confined to the juniper trees, and these being of comparetively small size, the original grandeur of the forest is but little impaired by the labors of man. The cypress is here the king of the forest—and this, with the gums, and all other trees except juniper, are left untouched. The cypress grows on the same kind of land with the black gum—which, as before stated, is much firmer than the juniper lands. The farmers here, who have given any consideration to the subject, suppose that though the juniper land, if drained, would sink and soon fail, that the gum and cypress lands would be permanent. No doubt they would be *more* durable—but the vegetable matter that will *burn*, will also *rot*, if placed in circumstances favorable to fermentation: and soon or late, all the *excess* of vegetable matter in the soil, not combined with, and fixed by the earths, and especially by calcareous earth, must rot away, and disappear.

We passed through sundry such changes of land, and of its vegetable cover, as have been described—but still a general uniformity of appearance prevailed, owing to the deep gloom and miry surface of the surrounding swamp, the sluggish and dark water of the canal, and its scarcely varying course. The only sign of life was seen at intervals in a "camp" of a pair of shingle-getters. Their houses, or shanties, are barely wide enough for five or six men to lie in, closely packed side by side—their heads to the back wall, and their feet stretched to the open front, close by a fire kept up through the night. The roof is sloping, to shed the rain, and where highest, not above four feet from the floor. Of the shavings made in smoothing the shingles, the thinnest make a bed for the laborers, and the balance form the only dry and solid foundation for their house, and their homestead, or working yard. Yet they live plentifully, and are pleased with their employment—and the main objection to it with their masters, (they being generally slaves,) and the community, is that the laborers have too much leisure time, and of ccurse spend it improperly. Their heavy labors for the week are generally finished in five, and often in four days—and then the remainder of the week is spent out of the swamp, and given to idleness, and by many to drunkenness. All the work is done by tasks: and the employers have nothing to do but pay for the labor executed. About 500 men are thus employed in the whole swamp, by the Land Company, and by numerous individual land owners. With all their exposure, the laborers are remarkably healthy, and almost entirely free from the autumnal fevers that so severely scourge all the surrounding country. It is said that no case has yet occured of a shigle-getter dying of disease in the swamp—nor did my informants know that any one had been so sick as to require to be brought out. A young white woman lately died, whose father and his family have lived ten years in the swamp—but she had just returned from a visit of some length to the open country outside. It is well known that the borders of extensive peats in Britain are healthy, and in that respect are very different from the marshes of the same regions.

At length we came to another straight canal, (the old "Washington Ditch,") by entering which a slight deviation was made from our previous straight course. This turn obstructs the view, and thereby adds to the pleasure of the surprise that immediately follows. But a few yards more are traversed, when the boat passes, almost without warning of a change, from its narrow and shaded channel upon the wide-spread surface of the lake. The boatmen, having exchanged their poles for oars, rowed nearly two miles toward the centre of the lake. It is encompassed to its margin every where by a thick growth of tall trees, in which the cypresses, by their greater height and singularly formed summits, show most conspicuously. The general level horizon presented to the eye by the surrounding forest, is made lower and irregular in two large places on opposite sides of the lake, plainly indicating the wide and desolating passage of the last great fire, which left nothing alive in its track, nor any thing standing, except some of the largest trunkss of trees, many of which still remain, though naked and scathed by fire to their summits. But so rapid is the growth on this swamp, that the burnt land is generally and closely covered by a young forest of considerable height, and among which are junipers of twelve inches through, which are already used for shingle timber.

It was a bright and clear day, and not a breath of wind was felt before emerging from the canal. But though there imperceptible, there was enough wind to ruffle the surface of the lake. The observer would at first suppose that the lake was in a great measure secured from the effect of wind, by its inland situation, and its close surrounding forest barrier. But high as is this barrier, it is low in comparison to the elevation of high lands in general—and the low level of all the adjacent country, and the vicinity of the Atlantic, permit to the winds such a sweep, that Lake Drummond is remarkably subject to their effects; and the violence of storms, is here about as commonly exhibited as on the sea.

The water, though clear and transparent, is so deeply colored by the extract of vegetable matter, as to seem black when seen in the lake and canals. When taken up in a glass, it is found that this deepness of color is delusive—and that it is about the color of ale rum or wine. It is every where through the swamp the same in quality though not always as deeply tinged. It is by some, considered medicinal, and is preferred for drinking by all the laborers and others most accustomed to its peculiar, and at first, disagreeable flavor, to any other water whatever. Some twenty-five years ago, invalids, and especially those suffering under pulmonary affections, were in the habit of visiting the swamp in the summer, to drink the swamp water for improvement of health; and they often remained for weeks together at a tavern on the Dismal Swamp Canal, beyond the opposite side of the lake.

The water in the lake, is now about 18 inches below the usual level, and of course we found the swamp so much the drier, and more accessible, near the borders of the lake. But notwithstanding this cause for the unusual dryness of the surface, and notwithstanding also, the thick carpet of recently fallen leaves and other vegetable matter on the surface, sustaining the footsteps, I was continually reminded, by the yielding of the miry earth below, of the unsoundness of the support. Through the greater part of the year, the basin of the lake is full to the brim, and overowing at many places into the surrounding swamp. The water in the Land Company's canal through which we passed, however, was then kept at its ordinary height, by means of a wooden stop-gate placed across the mouth of the canal.

The fish of the lake are of species similar to those of the ponds and fresh water streams of the neighboring country—but of some, the sizes are much greater. The gar is sometimes seen above five feet long. Some kinds of the fish are highly valued, and dining on them is not the least enjoyment of the pleasure parties that often make excursions in summer to the lake.

Reeds, at remote intervals, bear seeds which have a considerable resemblance to wheat, and which will make tolerably good bread. These seeds are so seldom borne and are usually so few, that most persons do not know of their existence. Whenever a reed brings seed, it dies the same autumn. A few years ago was a general and great "reed mast," as a full bearing of seed is here called—and all the reeds consequently died at once. The present growth is in many places as thick and as beautiful as ever—varying however in height in different places, as if of different years' sowing, from 18 feet to 9 or less. But it seems as if nature demands a change of crops in this as in many other cases. I infer this from walking into large pieces of ground covered by a former growth of reeds, of which all had died in the last great mast season, and not a single living reed had followed, or was seen on such places. It is a vulgar error that the reeds bring seed once only in seven years. There are few more beautiful single plants than a reed of large size—and their general appearance is as pleasing when in smaller size, they stand so thick as to form an almost impenetrable undergrowth.

It is not known to most persons that bears still inhabit the Dismal Swamp, though long ago driven from every other part of lower and middle Virginia. But proably most have thought, as I did before this visit, that they were so rarely met with, that the killing of a single one would be a matter for great exultation, and cause of some notoriety to the huntsman who was so lucky. But I now learned that they were so numerous,

that there were but few men who resided near the margin of the swamp who had not killed one or more. A youg gentleman o our party, had shot several dozens of these beasts. He told me that the largest weighed after being skinned and gutted, more than 500 pounds. They do not usually weigh half as much. It is difficult to raise many cattle or hogs on the adjacent farms, though the swamp furnishes such abundant food for both, owing to the slaughter committed on them by the bears. A bear will with ease kill a full grown cow, and has strength to drag away the carcass to a suitable hiding place. No dogs will hunt these animals to much purpose, and therefore it is not often attempted. The most numerous pack will seldom ever bring them to bay, and will never attempt to seize on them. The bears are traced and found by the hunters, by listening for the noise of their nightly drepredations in corn-fields, or among live stock, or when breaking the limbs of the trees they climb in search of acorns or gum berries: or they are baited and killed by traps, or havily loaded set muskets, the latter being a common and successful mode of destroying them. I heard related by the gentlemen of our party, and by the boatmen, sundry accounts of such adventures—and enough could easily be had to fill a second volume of Davy Crockett. Indeed, the story of one remarkable adventure which has been bestowed in print on Crockett, I believe, or if not, on some other western bear hunter, I found had been pilfered from the honors of an old borderer of the Dismal Swamp: for whether the story be true or false, (and it is fully believed here,) it had been told by the hero of it for forty years before his death.

Some more formal testimony of the great number of bears in the swamp was presented at the recent meeting of the Land Company, in a written proposal submitted to them by an individual for getting up their oak timber. This paper stated as a reason for their taking such measures, that the oaks were suffering, and many dying under the effects of the depredations of the bears. This statement which would otherwise have been to me impossible to conceive a meaning for, was explained by the account received of the habits of these animals. Heavy and apparently clumsy as they are, they are expert climbers, and in that manner seek the gum berries and acorns, which, in their season, form a favorite part of their food. To reach the acorns on the extremities, they draw to them and break off the limbs, even when of large size—and into these broken places worms of a particular kind enter, or eggs are laid, as in the case of the pine bug, and in time the trees are killed by their borings.

A still more ferocious animal found here is the larger of two species of what are called *wild cats*. This name is certainly misapplied—but my acquanitance with this branch of natural history is not sufficient to enable me to fix the kind of either animal, from the descriptions given. The larger is brown, with a short tail, and is about as large as a middle sized or rather stout dog. The smaller kind is mole-colored, and has a long tail. Pole cats are also sometimes found in the borders of the swamp.

The most singular recent fact with respect to beasts of prey, is the appearance here of a solitary wolf a few years ago. As no wolf has been heard of east of the mountains for many years, the kind of this destructive animal was not suspected until long after he had been committing his ravages on the sheep about Suffolk—and more than a year passed before he was at last killed. His howling had often been heard by the inhabitants of that town, so near did he forage—but as his shelter in the swamp was perfectly secure from intrusion, and he moved out only by night, and as no dog would pursue him, it seemed long impossible to destroy him. He at last, like many warlike or predatory heroes, from Sampson down to Macheath, fell a prey to female attractions. Tired of celibacy, he was seeking a mate, though of a different race—a bitch at a farm house: and her other suitors made so great an outcry over the foreign intruder, that his presence was discovered, and he was shot.

Upon inquiring for some one who had witnessed and was able to describe the great fire of 1806, the boatmen referred me to old Toby Fisher, who was then, as he still is, and has continued to be, a shingle-getter in the swamp. Accordingly, we visited Toby's camp—and his account was readily obtained. The first indication of the extent of the fire was the uncommon prevalence of smoke, and its long continued increase. But a shift of wind would remove it from the neighborhood of the laborers, and for as much as a week together they were free from it. At last, the fire approached so near that the falling of the great trees was heard in rapid and continued succession, like the reports of guns heard at a distance—and when still nearer, bears and other "varmunts" were seen fleeing from destruction, and some times singed and lamed from having been forced through the fire. At last the laborers nearest the approaching flames were driven in, and in such alarm, that all hastily embarked on the lake, and left the swamp. From 30,000 to 50,000 shingles, ready for market, which were the property of a single individual (the father of one of our party,) had been previously thrown into the old canal—but without obtaining much of the expected effect in saving them from the flames. The upper layers, above the water, having taken fire and been consumed, and their weight removed, the next layer would rise to the same height—and though wet, were soon dried enough, by so powerful a heat, to take fire also. Thus the shingles, which had been completely submerged, continued to rise and to burn, until but a small part was left. The fire continued about a month, and passed over the greatest part of the swamp. From other authority, I learned that the soil was in many of the dryest places burnt down as deep as two feet, producing such effects as have been already mentioned.

To such a fire, in former times, acting on a still dryer state of the swamp, it seems probable that the lake owes its existence, by the soil being burnt so low as to allow water to be retained, and of depth too great for plants to grow therein, which otherwise would have recommenced a growth of peat, and by it ultimately have filled again the void. That this vast basin was thus hollowed out by fire seems to be proved by stumps at the bottom being found charred on their surface—by the perpendicularity of the banks—and the operation is rendered probable, strange and great as the effect may be, by the reasonableness of its taking place, when the supposed existing circumstances are considered. I do not suppose that the basin was burnt to its present depth—and merely because it is not likely that the earth could have been dry to the depth of fifteen feet, or even half that depth. Butif burnt to three feet only, and then filled with water, the continued growth in thickness of the margin of the swamp generally, in the course of ages would raise the surface to fifteen feet above the present bottom of the lake.

But if the swamp soil is growing in thickness, and (as I suppose) the lake in depth, it is also believed and with much appearance of truth, that the lake is likewise continually growing in superficial extent. That this is taking place along a large part of its margin, is evident to present observers, and still more to those who remember the state of things many years ago, and have witnessed the gradual encroachments of the water. Some however doubt whether other parts of the shore may not be growing, by filling up. I do not see why the water may not be spreading on all sides. The violence of the waves, in high winds, must undermine and wash away the banks—and of the earth thus removed, the lightest parts are dashed over upon the swamp, where they dry and rot, or otherwise add to the depth of the soil—and the more earthy and heavy, serve to raise the bottom of the lake, and the more so where nearest to the banks—and in this manner to cause the regular deepening towards the centre that is found to exist. Until the parts thus filled up shall rise near enough to the surface to support plants, and thus gradually grow to be high peat again, the lake must be widening on every side to which the waves are driven by violent winds.

The following results, showing the proportions of vegetable matter contained, were obtained by subjecting to trial different soils of the Dismal Swamp. The method used was to measure the bulk of each specimen, by pressing it moderately and equally into a measuring glass, marked at equal portions of an ounce of water each. The measured portions of earth were then separately exposed, in an iron vessel, to a strong heat, for one or two hours, until each seemed as much reduced by combustion as could be by such means. Coal'y matter still remained with all the ashes, showing that the burning was not completely finished. All these soils have been before described, either particularly, or generally. The amounts lost may be supposed to show the comparative proportions contained, of vegetable matter

1. Of the soil of the reed covered swamp and (Mr. Daniel Jordan's) described page 517, taken about 1½ or 2 feet from the surface, 3 parts (oz. measures,) lost in bulk, by burning, 2¼ parts, or 75 per cent.

2. Of the gum swamp soil, also Mr. Jordan's described page 517. taken from 1 to 2 feet below the surface, (but quite free from any mixture of the clay sub-soil)—3 parts lost, by exposure to heat equal to any used, only half a part—or 16 per cent.

This became black by burning, but could not be made to take fire, as the other specimens did. So small a loss was unlooked for.

3. Of the gum and cypress swamp soil near the north-western side of the lake. This was presumed to be some of the highest and firmest land, as it had been ditched and cultivated by old Draper in turnips, the best of which were as large as musket bullets, and had leaves 6 inches long. The specimen was free from unrotted vegetable matter. Five parts lost by burning 4½ parts, or 90 per cent.

4. Of juniper soil, taken from 6 to 10 inches below the surface, and below all living roots or unrotted vegetable matter. The specimen was a black slimy mud, which gave no indication to the eye of having an excessive proportion of vegetable matter. Eight parts (half a pint) of the soil after burning, left one third of a part—showing the vegetable matter destroyed by fire to be 96 per cent. This specimen and the next, only, burnt with flame for a short time.

5. Soil of gum and cypress, under its original growth—about 200 yards from the north-western side of the lake. The specimen taken from six to ten inches below the surface, and free from living roots, or unrotted vegetable matter. Eight parts (half a pint) was reduced by burning to one third of a part, or lost about 96 per cent. This specimen was burnt at a different time, and with more powerful heat than the others.

Before closing these remarks, some speculations will be submitted as to the feasibility and policy of draining this immense body of swamp, supposing it permitted by the laws, and not opposed by any existing rights or interests.

In comparison with the magnitude of the object, it would seem to be both a cheap and certain operation to drain this whole body of land. All the water, except the rain that falls directly on its surface, it may be supposed flows from the streams coming in within the extent of some 10 or 15 miles of margin, from the highland on the western side. If a canal was dug through the western side of the swamp, its northern end emptying into the Shingle Yard Creek, near Suffolk, and the southern end emptying into the head of Perquimans river, which rises in the swamp and flows southward into Albemarle Sound, this canal would divert from the swamp all the waters which now run in and continually flood it, and the level of the water would be sunk just as deep as the bottom of the canal might be made. Lake Drummond would be deprived of its supplying source, and would become dry, except the deepest central part. Nearly the same extent of land might be drained, and the same objects effected, by deepening the Land Company's canal, and giving it a northern outlet to tide water, and by opening another cut from the Perquimans into the lake, and both parts so deep as to lower the water 7 or 8 feet. Either of these modes however would destroy the navigation of the Dismal Swamd Canal, for which such a vast amount has been spent. But probably the water might be enough reduced to lay the land dry, without hurting the navigation, or materially diminishing the present extent of the surface of the lake. If lowering the water of the lake 5 feet only, would make the land dry enough, that reduction of level need not deprive the great canal of any of its present supply of water, because its feeder from the lake now has 5 feet of descent, and of course might be as much deepened at the highest end. But if the middle section of the canal, between its highest locks, could be deepened so much as to dispense with those locks, every difficulty would be removed, and the navigation would be greatly improved and facilitated in future use, and the general drainage be made far more perfect.

But there is a prior question of some importance. If a general plan of drainage is ever so cheap in execution, and certain in immediate results, would it be advantageous to so change the state of the swamp? The policy is at least doubtful, though the balance of advantages seem to be in favor of the drainage. An immense body of most fertile land would be brought into cultivation: but it would rapidly rot away, and while rotting, would probably be as unhealthy, as it now is remarkable for healthiness.

But every thing on the subject of draining large swamps, held by many different proprietors, in Virginia, is mere matter for theoretical reasoning and of useless speculation. Nothing can be done in practice, no matter how great the promised advantages, or the existing evils. The laws, indirectly, yet completely, forbid the making of any such improvements on a large scale: and still greater obstacles are presented in this case, where, in addition to the existence of separate rights of hundreds of individual proprietors, there would be the chartered and landed rights, and conflicting claims, of two great joint stock companies. Under these various circumstances, it may be safely predicted that the possible good or ill effects of a general plan of draining the Dismal Swamp will never be practically known—at least, not during the continuance of the present legal policy of Virginia.

M. De Milly's Star Candle Manufactory, Paris.—The French appear to have effected a great improvement in candles by separating the crystallizable portion of tallow, the stearine, from its other constituents, and rejecting the latter in the composition of their bougies. But stearine itself is a compound of stearic acid and glycerine, and it is the former only which is wanted in the preparation of the most perfect bougies.

To accomplish this more perfect depuration, the stearine is converted into soap, with lime, and this soap is then decomposed by dilute sulphuric acid, forming an insoluble precipitate of sulphate of lime, and leaving the crystallizable stearic acid free.

The saponification of the stearine with lime, is aided by a high temperature, (140° cent.=284 Far.) which produces a corresponding pressure on the liquid, and by suitable agitation. The stearic acid, when separated, is thoroughly washed by hot water and steam, and then set aside to crystallize in tinned vessels.

The cakes thus obtained are broken up, put into sacks, and subjected to the gradual action of a hydraulic press. The greater part of the oleic acid is thus forced out, with a variable portion of the solid acid which it carries with it, depending on the temperature.

The material thus obtained is still more completely purged by a cold pressure in other hydraulic presses, not less powerful, but arranged horizontally. This leaves the solid matter of a splendid pearly white, exempt from odor, but not yet sufficiently purified. It is melted again in water, sharpened with sulphuric acid, washed, and cast into moulds, when it becomes a crystalline mass, and is fit for the preparation of stearine candles.

The strong tendency to crystallization presented a formidable difficulty in the moulding of the candles. In the earlier manufactory of the improved candles this difficulty was overcome only by adding twenty-five to thirty-three per cent. of wax, to the purified stearic acid. This added greatly to the cost.

An attempt was made at improvement by adding about a thousandth part of arsenious acid, in powder, to the stearic acid. This pretty effectually cut the crystals, (as the workmen termed it) but the process was objectionable, diffusing a disagreeable odor in apartments where many of the lights were burning.

M. de Milly now employs a more simple process, exempt from all reproach, and which requires only five hundredth parts of wax. It consists in disturbing the crystallization by a rapid transition from the liquid to the solid state, effected by dipping the moulds momentarily in water, of about the temperature of congelation of the purified material, and then pouring in the melted substance at a temperature but little higher than the melting point. This ingenious management secures to this fine improvement all the success that could be hoped for. The manufacture has become greatly extended; the wholesale price has been lowered from 2 fr. 25 c. to 1 fr. 75 c. and the retail price from 2 fr. 50 c. to 2 francs the metrical pound, while at the same time the quality of the article is much improved. A steam generator is used in De Milly's factory, for heating and in most of the mechanical operations, and about eighty people, men, women and children are employed in it.—[Bull. d'Encour. Mars. 1836.]

WILKINSON'S ALARM.

Sir,—Among the "Notes and Notices" in your 687th Number, I observe one describing an "*alarm-lamp*," said to be invented by a gunsmith of Easingwold, in Yorkshire. I apprehend the writer has made some slight mistake with respect to this invention, which originated with Mr. Wilkinson, the justly celebrated gunsmith of Pall Mall, London.

Having constructed a percussion-lock upon a new principle about fifteen months ago, which I considered applicable to large pieces of ordnance, and knowing Mr. Wilkinson to be the very best authority upon these matters, I obtained an introduction to him. Mr. Wilkinson received me with the utmost politeness; and having examined my new lock, he pointed out, in the kindest manner possible, the reasons why it could not answer the purpose for which I had intended it. He then exhibited and explained to me many

curious and ingenious things with which I found him surrounded, and, among other things, he showed me his *new alarm* for the detection of poachers, rick-burners, &c. This alarm consisted of a percussion-lock of a very strong and durable construction, fixed upon a stout post, from which wires were led in various directions over the grounds to be protected, in the same way as the wires of spring-guns used to be. The lock is made to communicate with a rocket or a maroon, or with both. In the event of any of the wires being touched, the lock is discharged, and striking a percussion-cap, ignites the maroon, the audible report of which alarms the persons who are on the look-out; a rocket at the same instant ascends, and remains stationary for five or ten minutes over the spot, throwing down a vivid light, which indicates the situation, and exhibits the progress of the depredators.

Mr. Wilkinson's alarm has been very extensively employed by noblemen and gentlemen for the protection of their property from midnight marauders, and it is the best contrivance for the purpose I ever met with. These alarms are in every way infinitely superior to the inhuman "man-traps and spring-guns," even were they still legal; they are properly described as "being perfectly free from danger to servants or others having the care of them; but calculated when they go off to strike terror into the breast of the most audacious depredator."

I remain, Sir, yours respectfully,

WM. BADDELEY.

London, October 8, 1836.

PORK ESTABLISHMENT OF MEXICO.—There exists in Mexico a very fine race of hogs, which are regarded as an important article of commerce, and the care which is taken of these animals so far surpasses that which I have seen elsewhere, I think it may be very useful to our farmers, brewers, and distillers, to be made acquainted with the principal details.

The buildings of these establishments include a house for the manager and the workmen, a shop, a slaughter house, a place for singeing, rooms and vessels for the fat and lard, (articles which often supply, in Mexico the place of butter) other rooms where black pudding is made and sold to the poor, and a soap manufactory, in which all the offals are used. The stables, which contain about 800 hogs, are behind these buildings. They consist of out-houses, well made, thirty feet deep, with overhanging roofs. The entrance is by a low vault, in front of which is an open space twenty-four feet wide, extending the whole length of the yard. In the centre of this is a stone aqueduct, through which flows clear water from a well or spring, the hogs being allowed to pass their snouts only, into the stream, through openings in a wall, which prevents their soiling the beverage. It is the only liquid they are allowed to take. They are fed with India corn, slightly moistened, and spread upon the floor. The pens and the space on which the animals walk are kept in great cleanliness.

The hogs are in the immediate charge of a number of Indians, attached to the establishment, and who often give them a cold bath, for it is thought that cleanliness contributes to that prodigious increase of fat which constitutes their principal value. It is the business also of these care takers to keep them in good humor. Two persons are employed from morning to night in adjusting their quarrels, and in singing to induce them to sleep. These persons are chosen on account of the strength of their lungs and ability to charm the ears of their amiable associates, which is deemed an affair of no inconsiderable merit!

The proprietor of one of these establishments assured us that the expense of it amounted to 300,000 francs, and that the sales rose to 10,000 a week, the luxury of his equipage indicated, in fact, the possessor of a large fortune.

From the Journal of the American Institute we take the following article on an interesting subject.

The following extracts from a correspondence between Mr. Durant, of Jersey City, and a well known friend of domestic industry, has been obligingly furnished us for publication. We think it will particularly interest our silk-growing readers.

NEW-YORK, Nov. 28, 1836.

SIR,—You will recollect suggesting to me last summer, that you was engaged in experiments to produce two or more crops of silk worms in one season. If this could be effected, it is evident the quantity of silk might be greatly augmented in our country. It is not necessary to dwell on the importance of experiments for this purpose, when we know that fifteen or twenty millions of dollars of our hard earnings are every year drained off into foreign countries, for silks which we consume. Fifty thousand bushels of wheat, say one hundred thousand dollars value, is sufficient to put our "*let alone*," or "*free trade*" advocates almost into convulsions, while their nerves are as calm as "a summer's sea" under a full knowledge that more than one hundred and fifty thousand times that amount in silk was imported last year.—But not to dwell on the absurdities of this misnomer, free trade, (which I trust our farmers, who are intended to be entrapped, will perfectly understand,) I will proceed directly to my object, which is to ask from you a detailed statement of your experiments the last season, in producing two or more crops of the silk worm.

Experiments for a similar purpose are making in France. The eggs have been kept from hatching in ice houses, until the time when the hatching process is to be commenced. Experiments made by keeping the eggs in a cellar, where the variation of temperature was from six to nine and a half degrees, were unsuccessful, being, as expressed, too great to keep the living principle dormant.

I am one who fully believe that we are, in a few years, to go ahead of all other countries in producing this commodity—a commodity which must be invaluable, in helping to a favorable balance in trade, as, like specie, it will exchange in any market in the world. Let the ingenuity and tact of our country be brought to bear on its production, and there can be no mistake. But our silk culturists should have early and accurate details of all important experiments made by each other.

Yours, respectfully.

MR. CHARLES F. DURANT.

JERSEY CITY, Nov. 30, 1836.

SIR,—Your letter, soliciting a detailed statement of my experiments the past season to produce two or more crops of the silk worm, is before me.

I agree with you in the opinion therein expressed, that "the silk culturists should have early and accurate information of all important experiments made by each other," though I doubt whether much benefit is derived from a publication of the crude essays and mere approximation to some desirable result in physical science. Such is the state of the experiments to which you allude; with the object only partially accomplished, I have sanguine hopes of ultimate success: and yet I fear it would tire your own and readers' patience, to hear a recital of all the reasons that support these hopes, or the causes which have operated to prevent the success of the entire series of experiments.

The desired object, as I remarked to you, was a succession of worms, from the first opening of the leaf in spring until it can no longer afford that nourishing matter so essential to the life and production of the worm. This, in the latitude of 40°, would embrace a period of about five months, say from May to October, and would permit nearly four successive crops to occupy the same shelves, allowing forty two days for the feeding or first state of existence, which, I think, will be the average duration, with the temperature of this latitude.

Seven successive crops, in this period of time, may occupy the same shelves, if for the first twenty days in the existence of each, they could be fed on a shelf specially appropriated for that purpose. This, I think, should always be done; for, at this age, they do not occupy one hundredth part of the space which they require when winding, and consequently, there must result by this mode, a great saving of room and labor to feed them.

By this method, I fed two crops on one frame the present season. They were both from eggs of 1835. The eggs of the first crop were kept uncovered the entire season, where they were deposited by the moth, at my residence in this place, exposed to York Bay and the sea air—the sash of one window lowered three inches, to admit at all times the temperature of the season; and, notwithstanding the extreme cold of last winter, every fecundated egg was hatched from the 7th to the 9th of May, before trees in the open ground had put forth leaves.

I had anticipated this result, and in autumn covered with sea-weed and bass matting a nursery of young trees in the garden. On these the leaves began to appear as early as the 17th of April, and by the 9th of May furnished abundant food for the crop, until they could be supplied from trees in the open grounds. They com-

pleted the first state of existence from the 17th to the 23d of June. The cocoons were large, and, with a few exceptions, perfectly formed. With a mere theoretical knowledge of the process, I reeled them without difficulty; and some sewing silk, which I made from the same stock, was judged by connoisseurs equal to the best imported from Italy. You saw specimens of the whole at the last Fair of the Institute, and I think you will agree with me, that the result of the experiment will warrant the assertion, that *silk worm eggs can be preserved uninjured through our coldest winters, and silk of a good quality produced without artificial heat.*

The second crop was from eggs of the same year as the first, and produced by *retarding* the process of nature. With this view, the whole experiment was planned and commenced as far back as the second state of existence, by enclosing the cocoons in a box, to shut out the light. They were then removed to the cellar, where the temperature was lower than the room in which they passed the first state. This kept the chrysalis back seven days longer than those in the feeding room. As soon as they attained the winged or perfect state, I separated the moths, to prevent copulation, till the end of six days, which is a further gain of four days. Most of the eggs were fecundated, as very few were deposited previous to copulation. The box was kept closed, and removed to the room previously described, which exposed the eggs to the same temperature and treatment as those for the first, except the exclusion of light, and removed to the cellar again in March, to prevent the temperature rising above 55 Fahrenheit. From the 15th of May, I opened the box a few minutes each day, to observe with a microscope the progress of the embryo worms, which had advanced so far on the 21st May, that I feared injury from the humid atmosphere of the cellar, and removed them to the feeding room. On the morning of the 30th, a few worms had escaped from the eggs; and, judging it imprudent to keep them longer in embryo, I placed them on a sheet of paper, exposed to the direct solar rays through the window. Every fecundated egg passed to the first state by the evening of the same day. They were in number about four thousand, apparently healthy and vigorous.

The first crop was now twenty-two days old, and occupying the frame on which they continued to be fed, until the winding of the cocoons, which was accomplished by the 21st of June, when they were removed, to give place to the second crop, which were now twenty-two days old, and so small, that up to this time, the four thousand were fed on two sheets of paper. On the 15th of July, most of the second crop had finished winding. The cocoons were generally small and imperfect, though a few among them were nearly equal in size and perfection to the first.

The probable cause of this deficiency in size and quality of the cocoons, can be traced to so many parts of the experiment, that a description of all would require more time than I can at present devote. The dampness of the cellar probably contributed largely, as *water*, in all its forms, whether in bulk, dew, or vapor, is a *bane* to the silk worm. In some instances, protracted rains obliged me to pick leaves in a wet state, and, though I dried them between cloths, probably particles of water still adhered to them. During the latter part of their feeding, the hydrometer indicated a humid atmosphere, and it was at times so cold, that Fahrenheit fell below 60°—an injurious effect, which I could not counteract, as I had resolved to dispense with artificial heat. That these were the most immediate causes, I infer from the fact, that a few of the cocoons were large and perfectly formed.

You remark, that "experiments made in France, by keeping the eggs in a cellar where the variation of temperature was from six to nine and a half degrees, were unsuccessful, being, as expressed, 'too high to keep the living principle dormant.'" In the degrees of temperature, I suppose you allude to the centigrade scale, as modern French chemists have wisely adopted the Celsius thermometer, by which pure water, under a barometrical pressure of thirty inches, will freeze at zero and boil at 100°. By this scale 9.5 plus corresponds to 49.2 of Fahrenheit, an average temperature *below* that of my cellar, which proves that the French experiments did not fail from the causes stated by them, but rather by commencing *too late*. To produce a second crop by this process, we must commence as far back as the moth of a previous year.

My experiments for a third, and succeeding crops, were to *hasten the process of nature*, by producing an artificial winter.—For this purpose, I placed the eggs of the first crop, as soon as deposited by the moth, in an ice-house, and, at the end of sixteen days, submitted them to the action of solar heat, without the desired effect.

Some eggs, after remaining six days where deposited by the moth, I submitted to a winter of plus 3° Fanrenheit, by mixing sulphate of soda five parts, and diluted sulphuric acid four parts; others to a temperature of plus 10°, by muriate of ammonia five, nitrate of potash five, and water sixteen parts, and then exposed them to the solar heat. Though these attempts proved abortive, I still think that nature may be supplied with an *artificial winter*, and eggs hatched the same month in which they are deposited by the moth.

When such a desirable result is accomplished, who will fix limits to the immense wealth which the silk worm will create in this country? Silk, from remote times, has been a source of immense wealth to Asia. Its cultivation has kept pace with the intelligence and riches of Europe.—Our country has all the essential advantages of climate for its production, with a numerous and intelligent population, who cannot fail to see the advantages of appropriating to their use the valuable labor and productions of a worm, which can create a greater revolution in political economy, with such simple means as nature ever employs to work good results, than did Gaul's great emperor make in political existence with the sword, fire, and concomitant horrors of a continental war.

Yours, &c.,
C. F. DURANT.

BUSINESS OF THE PORT OF BUFFALO.—By the courtesy of Capt. CARYL, Collector of Canal Customs, at this port, we have been favored with the following—Account of property passing at Buffalo, on the Erie Canal, to other States, in the year 1836:—

	Merchandize.	Furniture.
Pennsylvania,	1,909,260 lbs.	165,956 lbs.
Ohio,	27,621,432 "	3,310,936 "
Michigan,	21,814,542 "	4,819,554 "
Indiana,	4,323,070 "	144,808 "
Illinois,	5,570,904 "	1,257,548 "
Kentucky,	827,780 "	20,655 "
Tennessee,	477,608 "	
Alabama,	40,987 "	
Missouri,	145,539 "	18,324 "
Upper Canada,	80,213 "	123,996 "
Total,	63,011,335	9,871,777

This shows an increase of merchandize, over last year, of 26,090,275 lbs., or about 70 per cent., also an increase of furniture over the same year, of 523,388 lbs.

The amount of merchandize left at Buffalo, coming from the east, is 23,425,762 lbs., being about 1,100,000 lbs., more than last year; the amount of furniture left at Buffalo, coming from the east, 1,596,321 lbs., being about 76,000 lbs., more than last year.

Amount of property left at Buffalo, during the year 1836, coming from the east.

Sundries,	lbs.	84,180
Domestic Spirits,	galls.	29,309
Boards and Scantling,	feet.	194,154
Timber,	do.	12,876
Staves,	lbs.	550,000
Flour,	bbls.	1,840
Wheat,	bush.	37,645
Corn,	do.	11,097
Barley,	do.	1,827
Other Grains,	do.	4,850
Peas and Beans,	do.	310
Potatoes,	do.	640
Pork,	bbls.	803
Beef,	do.	101
Salt,	do.	53,169
Cider,	do.	437
Oil,	do.	38
Dried Fruit,	lbs.	27,380
Wood,	cords.	14,027
Clover & Grass seed,	lbs.	104,303
Flax seed,	do.	220,842
Wool,	do.	252,367
Cheese,	do.	55,653
Butter and Lard,	do.	4,494
Hops,	do.	9,109
Hemp,	do.	81,813
Apples,	bbls.	5,567
Mahogany,	lbs.	9,621
Fur,	do.	3,573
Peltry,	do.	295
Gypsum,	do.	265,810
Stone,	do.	16,637,455
Brick,	do.	1,065,760
Bacon,	do.	1,316
Merchandize,	do.	23,425,762
Furniture,	do.	1,596,321
Clay,	do.	2,347,076
Mineral Coal,	do.	435,700
Tallow,	do.	10,567
Pig Iron,	do.	1,120
Iron Ware	do.	919,357

Amount of property shipped, or first cleared at Buffalo, during the year 1836, going to the east.

Sundries,	lbs.	321,524
Domestic Spirits,	galls.	35,300
Boards & Scantling,	feet.	3,443,875
Shingles,	M.	620
Timber,	feet.	510,348
Staves,	lbs.	10,345,012
Flour,	do.	139,178
Wheat,	bush.	304,090
Rye,	do.	1,500
Corn,	do.	204,355
Barley,	do.	4,876
Other Grain,	do.	28,641
Blocks,	lbs.	52,580
Beer and Cider,	bbls.	39
Bricks,		783,930
Pork,	bbls.	7,383
Beef,	do.	805
Salt,	do.	1,549
Ashes,	do.	7,789
Oil,	do.	747
Dried Fruit,	lbs.	126,134
Wood,	cords.	14,027
Clover & Grass Seed,	lbs.	564
Flax Seed,	do.	174,720
Wool,	do.	17,160
Hides and Skins,	do.	86,076
Cheese,	do.	110,347
Butter and Lard,	do.	1,272,624
Hops,	do.	19,386
Bees wax,	do.	27,037
Tobacco,	do.	3,794,905
Leather,	do.	8,201
Fur,	do.	206,604
Peltry,	do.	68,190
Deer Skins,	do.	394,937
Stone,	do.	5,114,699
Feathers,	do.	29,386
Bacon,	do.	1,010,866
Merchandize,	do.	495,082
Furniture,	do.	851,816
Clay,	do.	3,844,000
Mineral Coal,	do.	67,582
Lead,	do.	21,489
Pig Iron,	do.	769,135
Iron Ware,	do.	661,749
The amount of tolls in 1835,		$106,213 58
" " 1836,		$158,074 99
Being an increase over last year equal to		$51,861 41

—a trifle less than fifty per cent.

It will be perceived that the greatest increase in the business of the canal, is in merchandize forwarded to other States.—This increase is greater in proportion to the capital than that of last year, and in all probability will continue to increase in geometrical instead of arithmetical progression.—Hence we perceive the great necessity of a speedy enlargement of the whole canal, to keep pace with this immense increase of business.—[Daily Star.]

From the Farmers' Register.

THE DIFFERENT ADVANTAGES OF LARGE AND SMALL FARMS CONSIDERED; AND THE INJURIES CAUSED TO AGRICULTURE, AND TO A NATION, BY FREQUENT AND INJUDICIOUS CHANGES IN THE OUTLINES AND LIMITS OF FARMS.

The statesman who plans and achieves an important change in any of the political institutions of his country, is rarely able to foresee the effects and extent of its future operation. However hurtful may have been an old abuse, its removal has probably introduced other unexpected evils, which though of less magnitude, serve at least to detract from the benefits of the change.—This truism is not a reason for opposing all proposed reformations—but it directs us to enter on even the most plausible, with the utmost caution and circumspection—and to doubt the existence of alleged universal and unmixed good effects of any past changes, until long experience shall have confirmed the truth of such opinions. The institutions which have long directed the accumulation and distribution of property, are the most endangered by the tampering of political reformers. It is in the regulation of property that errors are almost impossible to correct, even when their disastrous consequences have become apparent and certain.

The manner in which land has been distributed among the inhabitants of any country, and the degree of permanency with which land-marks are preserved, and existing possessions are held, produce all-important effects on the interests of agriculture, and on the prosperity of an agricultural nation. Yet this action has been scarcely noticed by those who have either caused, or suffered, the most effectual attacks on the interests of agriculture.—Whenever the distribution of landed property has been changed, whether by patriotic statesmen, or self-interested demagogues, the future effects on *personal* rights and power were only considered. There is no measure of our government to which these general remarks apply more truly, than to the destruction of entails and the right of primogeniture, in Virginia. The principal object of this measure, (and probably the only effect foreseen by the great statesman and pure patriot who proposed and carried it through,) was to insure the preservation of the equal political power of the people, by putting down forever the influence of the "landed aristocracy." But while the general, and repeated division of land was producing its intended and legitimate object, it has also been slowly and silently, but most effectually, assailing the agricultural prosperity of Virginia. This opinion will meet with few avowed advocates—indeed, not one, unless he is both fearless of popular censure, and careless or hopeless of popular applause.

Passing by the most apparent political tendencies and benefits of our existing legal policy of distributing lands, as a measure of state, I shall proceed to inquire into the incidental and unnoticed operation of the system on agriculture; and, through agriculture, on the public wealth and prosperity. It is not my intention to treat the question, (though well it deserves such extended examination,) as belonging to politics, or government, or morals—nor as affecting the feelings, prejudices, and happiness of individuals—but simply as a disputable point in political economy, particularly involving the interests of agriculture.

It has long been a subject for discussion, whether large or small farms are most profitable to their owners, and consequently most conducive to public wealth. In Britain, particularly, this discussion has engaged the attention of every able modern writer on agriculture; and every fact and argument have been adduced, which could be brought to support either side. There, strong reasons could be urged in favor of small farms, (say of 30 to 200 acres,) which would not apply to us: as for example—that the cultivated parts of the island were already generally divided into small farms, and that a great sacrifice of fixed capital (in houses, fences, &c.) would be caused by throwing 10 or 12 such farms into one; that the laborers on large farms were discouraged from marrying, and in consequence, that the increase of population would be obstructed, and the morals of the laboring class thereby injured. But notwithstanding these reasons, which cannot apply to a slaveholding country, and also other reasons, which are of general application, it is the decision of the most enlightened agriculturists of England and Scotland, that large farms are most profitable for the owner, the occupier, and also for the nation.

This deduction may be right, or wrong: and at any rate, I do not advocate the adoption of such opinions on mere authority, though supported by such names as those of Young, Sinclair, Brown, and Coke.—But *if* their opinion is correct, that small farms are least profitable, where land is rich, and its product is sold for high prices—where the system of landlord and tenant is almost universal—where small farms were already general—where the laborers were free, and the farmers themselves were accustomed to aid as well as to superintend the performance of every operation—then much more certain must be this truth in this country, where all these circumstances are found reversed. But let us examine our situation in this respect, without reference to, or comparison with other countries.

Both large and small farms possess peculiar and opposite advantages; and the interests of a country would be greatly injured, by its land being universally, or even very generally, kept in either very large or very small divisions. Let me not therefore be misunderstood as supporting a state of things equally absurd in theory and impossible in practice, when I shall state the peculiar advantages of either plan of division, or contend for the superiority, in particular respects, of the one size over the other. It is also requisite, in discussing the respective advantages of large and small farms, to dismiss from our minds every argument built on the personal and peculiar characters of different individuals. An industrious, economical, and intelligent farmer, however inconveniently situated, may derive more income from his capital than his indolent and wasteful neighbor, possessing ten-fold advantages: and yet no such fact, nor any number of them, will prove the situation in which the former was placed, to be better than that of the latter.

The small farmer, who works only one or two horses, and three or four laborers, and who himself labors as well as directs, possesses the great advantage of being

able to exercise the most perfect economy and industry in the management of his farm. If he drives, feeds and stables his own horses, he can derive the utmost amount from their labor, and they, the greatest benefit from his care and attention. Almost nothing is lost by waste or neglect, because the farmer can see, or attend every thing. All the various little savings from such sources, are sufficient to cause the provisions, stock and labor of the small farmer, to be more efficient *in the particular manner in which they are directed*, than an equal amount of capital employed as part of the expense of a large farm. But the manner, or plan, of directing capital and labor on small farms, is necessarily and greatly inferior to that on large farms, for reasons that will presently be offered. By making the best use of the economical advantages just alluded to, many of the small farmers of Augusta county are more thriving than most of our richest landholders: and if most of our farms were as small, and all their cultivators showed the same untiring industry and frugality, no doubt there would be a great increase of individual profit, and public wealth, in spite of all the disadvantages inseparable from small farms. But unfortunately, such examples are rare, because there are rarely found farmers so admirable for frugality and industry: and when the owner is lazy, improvident, or drunken, all the net income of a small farm will speedily vanish. In every case, the personal habits of the cultivator, whether good or bad, must more immediately affect the net product of a small than a large farm.

But notwithstanding the superior advantages that small farms enjoy, in many respects, it is still undeniable that on them the operations of agriculture can never be well performed, nor can the greatest net products be derived, nor the most valuable improved processes carried on, for want of the skill which only a division of labor can produce; and still more, for the want of the best utensils, machinery, &c., which can only be used on large farms. It is well known that the profits of all complicated manufactures depend greatly on the extent of the establishment: for example, that a cotton factory may be highly profitable if suited to employ 200 laborers, and yet ruinous if the works were erected only to employ 20, because many expenses to be incurred must be nearly as heavy in the small, as the large establishment. Precisely the same causes of profit and loss are to be found in the extent of the operations on different farms.

Let us suppose the existence of two neighboring farms of the average fertility, (or rather I should say, the average poverty,) of lower Virginia, and similarly situated, except that one is in size 1000 acres, and the other only 100, and both cultivated by slaves, in numbers suited to the respective farms. On the first, the owner can afford, (and the expense is for him true economy,) to keep good teams, the best ploughs, and a wagon to convey his crops to maket. He has sufficient farm-houses, and costly machines of the best construction suited to prepare his crops for market, such as a thrashing machine and fanners for wheat, or a good gin and press for cotton, &c His income permits his employing an overseer of the best mind and habits that can be obtained. His extensive operations enable him to profit by the division of labor, and thereby improve to the utmost the skill of his laborers, each in his respective department. It is not every man who can learn to be a first rate ploughman, and for even those so gifted, long practice with good implements is indispensible. In the case we are supposing, a few men selected for their qualities from thrice their number, are kept through a large portion of year at ploughing, and have every means to perform perfectly that operation, upon which so much of the success of tillage depends. The same remark applies to every other operation, for which good or expensive utensils, and much skill in using them, are required. When accidents or disasters occur, by which the cultivation of a large farmer loses labor, implements, or even expensive fixtures, his income enables him to supply the deficiency, without incurring the still greater loss that would probably be caused by delay, or the inability to remedy the evil. He is not compelled to sell his crops at inconvenient times, or at the lowest prices, but may supply the market according to the demand existing, greatly to the benefit of the public as well as himself. Similar examples might be greatly extended, but these will suffice for the purpose of comparison: and in every such case, an application of the same circumstance to the small farmer will make evident the unavoidable disadvantages under which he labors.

If the owner of 100 acres makes wheat, he must prepare it for market by the slow and wasteful process of treading out by horses, as his crop is not large enough to justify the expense of a thrashing machine; and if he had one, his laborers would be too few and too unskilful to use it. Implements of less value, and suitable teams, he may (and certainly ought to) have; but the fact is notorious, that on such a farm, and on many much larger, it is very uncommon to find either a good fanner, plough, harrow, or a well matched pair of horses. There can be scarcely any division of labor, nor of the skill caused by it, as of the two or three men employed, each has to do something of almost every operation. From these causes every process will be performed not only imperfectly, but at great loss of labor, and perhaps of crop also. If the owner employs an overseer, he must be at the lowest wages, and generally of the most worthless kind. But the more common course is for the farmer to be his own overseer—and as there are but few who labor regularly themselves, or who do not withdraw a large portion of the time from the actual superintendence of their slaves, (who only work when compelled,) there will necessarily follow the loss of much labor and product to the farmer, and be much consequent diminution of the public wealth. To pursue the parallel, the small farmer loses a horse, or his best slave—and as he has no means of supplying the deficient labor for a considerable time, to the first loss there is generally added another, equal to a third or half of his growing crop, for want of the labor so lost.

The large and the small farm are alike burdened by the erection and repairs of a dwelling house, barn, stable, &c. for each: and though these buildings will be more costly on the large than on the small farm, still the latter is far more heavily taxed in this way, in proportion to the income or capital. If the total necessary expenditure for buildings on the large farm (1000 acres) be $4000, the small one (of 100 acres) will certainly need $1000, which is more than double a proportional amount.

Finally—wealth is not always (nor indeed often) accompanied by education, intelligence, and public spirit—not does poverty always banish these qualities and their valuable effects. But yet no one can deny that every benefit from these sources that has served to improve the state of agriculture, has been owing to the occupiers of large farms. Examine the history of agriculture as far as it is known, and no considerable improvement has ever been introduced by the small farmer.

The full consideration of this subject leads irresistibly to the conclusion, that large farms, (not too extensive for one man to superintend, or for the advantageous employment of the requisite labor,) are the most conducive to both the profit of the owners, and the public wealth. But however true may be the general proposition, God forbid that some future political Procrustes should have the inclination and power to put it into practical operation, by throwing our small farms into large ones, as effectually as the statute for the equal distribution of lands serves to cut up both large and small farms into still smaller divisions. The enormous losses that this policy has already produced to agriculture, and to the commonwealth, cannot be remedied nor lessened—and it is equally vain to hope for any cessation to the same disastrous course. If our landmarks could henceforth remain permanent, or be altered only when both public and private benefit would be promoted by the change, then the existing divisions would serve to produce all the benefits from large, as well as from small farms. But the course we have pursued, and still continue to pursue, seems to fix upon ourselves all the evils of the worst planned divisions of land, with the additional and still greater evil of endless change.

Let me repeat, that I am not treating of the equal distribution of land among the former owner's children, as a measure of state, but only as it affects the interests of agriculture. If the establishment of this policy was necessary to secure our freedom and political rights, then was that object wisely purchased by almost any sacrifice of pecuniary interest. But I confess that I view this dread of the ascendancy of the "landed aristocracy," as altogether unfounded—as the fear of a shadow, of which the substantial cause had never reached this country, and which was then almost expiring even in England. We have now left but few specimens of the nearly ex-

tinct "landed aristocracy" of Virginia, which serve to show how powerless men may be, although possessed of 5 or 10,000 acres of land. These gentlemen, on the average, are neither more nor less estimable than their poorer neighbors of equal intelligence: yet so completely are they disfranchised by their wealth, that I doubt whether any one of them could exert as much electioneering influence as some constable of the same county, or could successfully compete for public office with any respectable deputy sheriff.

If government did not interfere with the accumulation and distribution of land, and array our prejudices and feelings in support of its policy, the matter might safely be left to be decided by men's sense of self-interest. But government itself, has been the great disturber of our landmarks—and in Virginia, the means that are acting to produce this effect, and all the incalculable consequent losses, is the total repeal of the statute of entails, and the substituted legal policy of equal distribution of land among the heirs of intestates.

The proprietor of every farm, whatever may be its size, throughout his whole occupancy is directing his labor and improvements to render his land convenient and profitable according to its then boundaries and extent. He considers that a certain portion of it should be arable, and perhaps he is for 40 years gradually clearing woodland to attain that object—and this arable land will most probably be in one compact body, and on one side of the farm, because such is usually the most convenient plan. Another portion of suitable size is left in wood, to supply fuel, and timber for fencing. The dwelling house is suited to the degree of wealth and the wants of the family of the farmer—and his farm-houses, to the amount of his crops and live stock.—All these arrangements we will suppose completed, when the owner dies intestate, and the law divides his well arranged farm among five or six children. The commissioners appointed to make the division, may use the utmost care to guard the interests of all the heirs, and yet, (if there are minors among them,) they will scarcely avoid a loss of property equal to one-fourth of all the land. All the buildings being contiguous, they will seldom fail to fall within a single share: and though buildings in such cases are never valued at half their worth, (on account of their new owner's situation,) still even at that low estimate, that share receives so much in buildings, that it must have but little in land. The new owner will possess houses numerous and extensive enough for a farm of 600 acres, while his whole possession amounts to 40, without timber or fuel, and which cannot rent for enough to keep his houses in repair.—Of course they go to decay, and the greater part of their value is an entire loss to the owner, and to the country.

The next share, or perhaps two of them, may include part arable and part woodland. The owner of such a share may be deemed fortunate, as it *may* be kept and cultivated as a farm, though under great disadvantage, as soon as the owner shall have erected suitable buildings, and made new fences. This expense, however, is another total loss or diminution of the value of the property, caused solely by the previous division.

Another share may probably be altogether of cleared land, without any materials for fencing or fuel—and the remaining ones altogether of woodland, which the owners' whole lives would not enable them to clear, and put into order as distinct farms. Neither of these shares would be worth even half their former value to the new owners.

Divisions producing losses of this kind are of every day occurrence, though under every variety of circumstances. Fewer heirs, or a different situation of the farm, may diminish the loss—more heirs, or a widow's dower right, may greatly increase it. But it is scarcely possible for any cultivated farm, (not of too great extent before,) to be divided into even as few as two shares, merely because it has two owners, without a considerable and permanent loss being incurred—and a public as well as a private sacrifice of property made.

But, it may be objected, that these heirs may sell their shares of land, and thus avoid the losses that would follow the retaining the property. It is true that they may sell, and the necessity of the case often compels a sale of the separate shares—but at what a sacrifice! If any of the heirs are minors, or if the widow lives and holds her dower right, no agreement can possibly be made for a general sale of the whole farm, which is the only way in which its former value can be preserved. In most cases, the sales are necessarily made separately, and for no greater sum than each share is worth to the particular heir, holding it alone. Nor can it be worth much more to the buyer, who is usually some neighboring farmer, whose other land only enables him to draw some income from a possession which was almost worthless to the unfortunate heir.—He who is adding to his possessions by purchasing from time to time the inheritances of others, is also subject to great inconvenience and loss, in thus making a large farm by a patchwork of smaller pieces. To suit his new purchases to his own general plan, he has to clear woodland in one place, and let arable go waste in another—to pull down, or leave to rot, a building in one remote corner, while he is obliged to erect others in more convenient situations. If, in such cases the purchaser really gained *all the value* which the seller lost in his land, the public wealth would not be a whit diminished: but in truth, the difference in value, caused by dividing a farm, is totally lost to both buyer and seller—to the individuals concerned, and to the nation at large. The purchaser may afterwards so improve his newly acquired land as to make it worth more than before it was taken from the original farm: but if so, this new value will be entirely the fruit of his own industry and capital, and does not restore the former loss by division, which is gone forever.

Such divisions of farms must be expected to take place almost as often as the death of their owners occur: and each division probably causes an average irretrievable loss of value of 20 per cent. on each farm. The more that farms are reduced in size by this policy, the more heavy these losses must become—for large farms can be divided at a much less sacrifice of value than small ones. If we count the average loss from such divisions at one fifth of the value of the land, and suppose the average interval of 100 years before it will be necessarily repeated, (and this is moderate enough,) it amounts to the utter destruction of one fifth of the value of all our lands once in 100 years: aye—a destruction as complete and effectual as if one fifth of Eastern Virginia was swallowed by an earthquake. Is not this enormous, continual, and increasing drain from our private and public wealth, a cause sufficient of itself for the manifest decline of our country?

Besides the loss of capital which has been caused by our *patchwork* policy—(this regular system of cutting up farms, and then uniting the ill-assorted fragments into other farms, only to be cut up also in their turn—) there have been other consequences, not less deplorable.

The first is, that almost no improvement of the soil has been made, nor can half as much be expected in future, as would take place under other circumstances. Every farmer is either the owner of an ill-cut slice of some former farm, or he has made a large farm by patching together the detached fragments of several others; and in either case his main improvement, for a large portion of his life, must necessarily consist in laboriously *undoing* the improvements which were as laboriously made by his predecessors.

Secondly—every costly mansion, and even most good farm houses, become nearly useless after the death of the first owner; and consequently we are contriving to lower the scale of usefulness, as well as of cost, of all buildings in the country. Arab tents are indeed better suited to our patchwork land policy, than substantial houses of brick or stone. Neither can we, with any expectation of profit, resort to the use of live hedges, or other durable and costly fences, as they would soon be rendered useless by the death of the owner, and by the consequent new dividing lines rendering new sites for fences necessary.

Thirdly—there have been very few farmers' sons well educated, since this impoverishing system has been in full operation—and the political influence and dignity of Virginia have sunk with the intellectual cultivation of the class that formerly upheld both.

It is true that when the shares of land that would be made by a division are so small and worthless that it is impossible for any one to draw a support from their cultivation, the law permits a general sale, provided that all the parties, and the next friends of minors, will concur in certain legal formalities, which seem to have been contrived for the benefit of lawyers, full as much as for that of the heirs. The trouble and cost of this proceeding amount to no small tax, and such cases scarcely deserve mentioning as very partial exceptions to the patchwork system.

The law forbidding entails and destroying the former right of primogeniture, certainly does not *compel* equal divisions of land; as every man may, by his will, keep his farm together, by giving it to one only his children. But the law forbids his continuing a like disposition of his land through future successions, which alone would effect a permanent benefit; and there is no inducement whatever for a father to make such distinction between children equally dear to him. The law has stamped with reprobation all such unequal bequests, though they are not absolutely forbidden: and under present circumstances, a father will best satisfy his children's expectations by dividing his farm among them, though at a sacrifice of one-fifth of its value. It would be both unjust and inexcusable, now, for a father to give all his land to one child, while to others were left legacies of much less value. But if the settled law of the land had so fixed the succession, there would have been no injustice committed, nor complained of. The succession to property, in any manner whatever, is the creature of social institutions—and it ought to be so directed as will be most beneficial to both private and national interists. The popular arguments urged against the justice of entails, might be as correctly applied to prove the injustice of the rights to private property altogether, and of every institution of society, which enables one man to possess lands and moveable goods, while his equally meritorious neighbor is destitute of both. Yet every one who is above the grade of a grog-shop orator knows that the institution of the right of property is of inestimable benefit even to the most destitute class of every country.

The extension of the entail system in Europe has been a great public evil—and has served to obstruct the national welfare, as much as our totally opposite policy promises for ourselves. The permanency of landed possessions, and the facility of dividing and alienating them, are both to be commended so far as each course may produce public benefit—and either should be opposed when likely to cause injury to the commonwealth. An entail system that could serve to prevent both such accumulations and divisions of land as were manifestly unprofitable and injurious, and which would not prevent such divisions and alienations of entire farms, as the public interest might require, would prove of the greatest benefit to agriculture. Such a system would secure the object that I have endeavored to advocate, the permanency of the boundaries and existing value of farms, both great and small. The permanency of the succession in a particular family, is comparatively an unimportant consideration; and only worth the stateman's attention so far, as the expectation of that continued succession may prompt to greater individual exertion, and consequently, produce the greater ultimate benefit to the nation.

The statesman is wretchedly short-sighted who does not aim to direct the institutions of his country so as to receive support and strength from the folly and vices, as well of from the wisdom and virtues of mankind. Wisdom will thus derive support for the general welfare, from some of man's basest propensities—while ignorance will use his noblest qualities for the purpose of doing harm. Every individual is more or less influenced by avarice, or by a taste for prodigality; and both these evil dispositions may be exercised for the public good, under the entail system. Is the landholder a niggardly miser? So much the more will he value the permanent nature of his entailed land—and judging his posterity by himself, he will not suppose it possible that they will ever lose possession of the property. His most secure hoard will be the surface of his farm: his savings will be vested in durable fixtures and buildings, as being more safe than bonds and mortgages: and however small may be the early or annual income from such investments, still it will be so much clear gain to his posterity and to the nation. The beneficial effects thus produced by the operations of avarice, would compare with the admirable labors and valuable products of the religious community of Shakers. In that singular society religious fanaticism and discipline counteract the usual tendency of property held in common—the corporate nature of the society, produces the same consequences as would the entail of their land—and the prosperity and wealth of the society, show the wonderful accumulation derived from their system of wasting neither time nor labor, and putting every surplus product to some immediate and productive use.

But suppose the landholder to be a spendthrift. Even in that case, his vice may be beneficially directed. The tenure of his property will probably induce him to erect magnificent buildings, or to form costly pleasure grounds and gardens filled with choice fruits and rare plants. Or perhaps he will undertake some visionary and costly improvement, which though a cause of loss and perhaps ruin to himself individually, will remain of permanent value to the country. These channels of prodigality under existing circumstances are seldom used: for even a spendthrift's calculations must show him that such expensive plans would not answer on lands which are so soon to be divided, and to pass thus divided into the possession of different strangers. To such a vent for prodigality and ostentation the civilized world owes the erection of piles of architecture in Europe, that will be admired for many centuries. If the noble canal which England owes to the enterprise and lavish expenditure of the Duke of Bridgewater, had proved an entire failure as to yielding profit—that is, if the expense had been so great that all the tolls on the canal, when completed were required to pay the interest of its cost—then the whole cost of the work would have been lost to the constructor, and also to the general capital. But if, notwithstanding that the enormous cost of the canal had destroyed all hopes of its yielding any profit to the undertaker, it still served as greatly as it has done to benefit trade, and to induce the construction of other valuable public works, better planned and more economically executed, then England would have been indirectly greatly benefitted by the prodigality that had (according to our supposition) caused the Duke of Bridgewater's impoverishment. Without the existence of entails, men will certainly be not less disposed to indulge in lavish and ruinous expenditure: but their waste will be on costly entertainments, and ostentatious hospitality—the luxuries and fopperies of dress and of equipage—in hunting, racing, and gaming—and all other such transient and unproductive pleasures, which leave behind no monument of their having existed—except in ruined estates and impoverished heirs.

Under the operation of our existing policy the owner of a farm is discouraged from making any improvement of a nature that will have its value destroyed, or materially impaired, by the inevitable division of the land. The consideration that in a few years probably his farm will be cut up, and the value of his labors partially or totally destroyed, must affect all his important plans. But on an entailed farm, whether it contain 50 or 2000 acres, his judgment and feelings would concur in prompting a different course, and the one most advantageous to his country as well as to his successors. He would use no merely temporary expedients. His improvements and the arrangement of his farm would be intended to serve for ages to come. The durable fertilization of waste or barren fields, the erection of the most substantial structures, the planting of live hedges, fruit and timber trees, would be intended not only for his own benefit, but for that of his latest posterity. He would be both stimulated to act, and rewarded for it, by the belief that his works would last, and his name be remembered with gratitude and honor, for ages after his body had become dust.

CONSERVATOR.

The following excellent article on the subject of the three important scientific enterprises undertaken by our government, is from the pen of a gentleman who has paied much attention to these subjects and is practically and theoretically, well qualified to speak concerning them. The labors of Mr. Hassler are not as well understood and appreciated in this country as in Europe. Several of the most eminent of modern astronomers have given most complimentary testimony to his peculiar fitness for so great an undertaking. Yet with all this, will it be credited that the compensation of the superintendant of the coast survey of the United States, is only $3000 a year—this is *tendered* (for the honor of our country, we will not say, *considered*) a suitable compensation to one of the first astronomers of the day, engaged in one of the most delicate, and at the same time, extensive geodetical works ever undertaken.

On these subjects we have more to say

—we shall again speak of them when time and space will permit.

From the Albany Argus.

SOUTH SEA EXPEDITION—SURVEY OF THE COAST—WEIGHTS AND MEASURES.

Sir,—Among the several national projects mentioned in the message of the President, and the documents accompanying it, I have noticed with much pleasure that the South Sea Expedition, the survey of the Coast, and the manufacture of standard Weights and Measures, have received peculiar attention. This is appropriate, inasmuch as each of these works may be considered important, not only for the peculiar desiderata intended to be supplied by their proper execution, but as patroning and bringing into contact and action the science of the country. The notice given by the President to these among other objects of more particular and immediate concern, is therefore gratifying as indicative of a high and proper estimate of their value It appears indeed, that in each of these undertakings, certain minor troubles have arisen, sometimes from lack of sufficient authority in the department having charge of their primary organization—and sometimes from the operation of that necessary rivalry among officers and professional gentlemen exercising functions of a different nature, when they are for the first time made subject to a sole and unaccustomed authority. Bad effects may have also originated from a cause known to operate to a certain extent throughout the country, viz., an indisposition to patronize foreigners of distinguished talent; or to use them only till they had initiated us into the details of some scientific process, and then whistle them off to provide for themselves. This is a mawkish and dishonorable feeling, which can exist only in young communities, and which we hope soon to see extirpated entirely from this.—When Miller, the musician, found Herschel, the astronomer, an obscure clarionet player, in the band of a country village in England, and invited him to share his lodging, it can scarce be believed that the patronage of the Englishman was either stinted, or unpleasant, because his protege was a German. Nor have we ever heard that Englishmen have been jealous of the elder Herschel, because he was a native of another country than their own—nor refused on that account to display his discoveries among their proudest conquests in science.

But in regard to a proper execution, in this country, of works having relation to general science, rather than to any appropriation of its advantages to our own use and profit, there is, perhaps, yet another incapacity lying still deeper, and which reults from the circumstance that we have as yet no predominant scientific establishment, or national institute, which, possessing alike the confidence of the government and the nation, can take cognizance *of*, and give recommendation *for*, the proper conduct of projects of this character. Heretofore the charge of such works has always been assigned by Congress to the Executive, and by him committed to some one or other of the departments. Now, though each of the Secretaries has his appropriate function in managing the correspondence. the defence, the currency and commerce of the nation, still to none of them belongs. in a special manner, the patronage of science, unless as it affects his own peculiar department. We may expect them also to be bound by legal restrictions and formalities, which could all have been foreseen and obviated in the sittings of such a national academy as I have described.—That the efforts of the government have been retarded and deranged from the lack of such an institution, is evident from the statement of the message, that the duties of the President, and Secretary of the Treasury, have been too multifarious and burthensome to permit the requisite attention to certain of these public works. I do not make these suggestions invidiously, or for any bad purpose—the official communications give themselves the authority for the facts; and though I am of opinion that the recommendation of th message, to invest a separate board with the control of such works, must tend only to multiply official relations already too numerous, and increase a correspondence already complained of,—still the deference due to the highest authority in the nation shall prevent me, for the present, from entering into any argument on the subject. I propose to myself a more pleasant duty, in presenting through your columns, nearly the present state and prospects of these public works. And I do this mainly for the reason that from us, of New-York, they have seemed to receive less notice than they deserve.

Of the expedition to the South Seas, little at present can be said, as its preparations and arrangements are yet imperfect. The difficulty in procuring the necessary equipment for the ships, is the matter principally complained of in the report of the Secretary of the Navy. This must have been foreseen, and is undoubtedly fortunate, as affording more time to mature the plan of the voyage, and to organise and discipline its equipage. We are, I know, as a nation, prone to do things in a hurry; but this prevailing passion should not be indulged here. The proper arrangement of an expedition, whose results are to be judged of by the whole scientific world, cannot be too well thought of, or too carefully defined. If a scientific project fail in our own hands, we have only to take care that the failure be not known: but this will not answer here. The results of the expedition must become the property of the world, and there will be no honor unless they be worthy of the nation.

The two other projects mentioned in the message,—and which I have endeavored to class generically with the first, as of a character partaking rather of the encouragement due by the government to science in general, than of any exclusive appropriation of its advantages to the wants of the community,—are the Survey of the Coast, and the establishment of an uniform Standard of Weights and Measures.—These two works have been in progress for about the same period, under the direction of the same superintendent, Professor F R. Hassler. And it is more our duty of New-York to understand them fully, not only because, from our extensive commercial relations, a proper execution of these works is more important to us than to any other section of the confederacy, but because the superintendent, though a foreigner, has by a residence among us of more than thirty years, given us a right to claim him as one of the citizens of this State, and imposed upon us the duty to encourage and patronize him in his labors. He has many claims to our consideration, but it is the fashion now to speak of things and not of men. I will, therefore, briefly refer to the progress of these two works, since they have been committed to him.

A survey of our extensive Coast was first found necessary about the year 1805. It had then been discovered by American statesmen, that parent countries always keep the commercial knowledge of their colonies as a leading string in their own hands—and that as practical navigators, American seamen know less of their own shores, than the country and its allies from whose subjection we had so recently delivered ourselves by force of arms. In large vessels, three nations, the Dutch, the French, and the English, approached our harbors with less risk than those bearing our own flag: at the same time that in small and more manageable vessels, we had long been known as a match for the strongest. The President—Jefferson—saw the defect and the manner in which it must be remedied. We were at that time on the brink of a war, about whose justice some of our politicians differed in opinion, and it was of course more necessary to *pray* for a fortunate resalt than to *preach* of the causes which had occasioned the quarrel. To have procured for the nation (even if it had been practicable so to do,) the old charts from the Dutch, French, and English governments, would have only been to put our knowledge on a par with theirs—while to execute more recent and accurate surveys, was advancing the new country above the old With the clear and bold perception, which always distinguishes men of genius, when they are entrusted in times of danger with the destinies of a nation, the President recommended a survey of the whole coast, with all the aid of the more recent discoveries in science. The survey as recommended by him was to be of the kind then recently executed in France, and in progress in England. It was to cover the whole defensible part of the seaboard, extending from the shores to the gorges and defiles of the first highlands:—to be bases upon a primary triangulation, with sides of from 10 to 60 miles in length, affording at once the advantage of confining the errors incident to every similar operation, within the nearest limit in the longest distances, while it supplied the greatest facility both from the number and accuracy of points merely of detail. The project unfortunately was in advance of the science of the country. The perfection possible to be given to circular instruments was not then much understood; and the matter most creditable to the country, both in the design and execution, escaped in a great

degree both notice and commendation.—There were then few men among us to whom the excitement incident to the birth of a new nation and the organization of a new government, had allowed sufficient of leisure to think of the means by which its future destinies might be improved or illustrated. The survey of the coast was of course discontinued. In 1832, under the present administration, it was revived, and has been continued to the present day; the primary triangulation having been conducted by the superintendent, and the detail-topography and sounding either by junior officers of the army and navy, or by civil engineers, to whom the honor of em ployment in an important work has been sufficient inducement to attract them into the service.

The work has advanced from near the mouth of the Connecticut to the Delaware, above Philadelphia, and there seems to exist no impediment to its future progress, except what has arisen from some misapprehension as to the powers and compensation of the superintendent. He, as we learn from the documents, is allowed $3000 per annum, with his expenses—a sum so evidently incongruous with other salaries, that I perceive it has not yet been registered in the blue book, doubtless for fear that in the eyes of foreign nations it might reproach us of penury when we have plenty. This has, I presume, only resulted from lack of sufficient authority in the law authorizing the work; and as it is now submitted to Congress, this difficulty will of course be removed. Men should always be paid in proportion to the talent and industry which they expend in the public service; for if an opposite principle be once admitted, not only will the service deteriorate in character, but the government will lose the most distinguished feature of a republic—all employments, whether of trust or of honor, must become the property of the rich, for to such only the compensation could be a minor consideration.

To the same superintendence has also been confided the construction of standard weights and measures The lack of uniformity in this particular, and which in the simple but just language of the superintendent, "*amounted to an actual distribution of injustice*,"* had been repeatedly presented by the Executive for the consideration of the nation. This work was preceded by a preliminary comparison of the different weights and measures used in the country, which were also, so far as they deserved such notice, referred to the later and better authenticated standard of foreign nations, than extant among us. Finally, the unit of length adopted was the mean yard of a scale of 82 inches, made by the late celebrated Troughton, for the survey of the coast: and which is one of a family of scales by which the standard of English measure has been preserved. The base of the system of weight was determined, as in England, by the Troy pound; that weight having always been used in the English mint, and among the dealers in gold and in medicine. The wine gallon and Winchester bushel were also taken at their English statutory dimension. But in measuring the standards of capacity, it was determined instead of taking water at the temperature of melting ice, (a fixed point of the thermometer,) as the French have done, or the mean temperature of the climate, as has been used by the English, to take the weight of water at its *maximum* density: a point as fixed in its temperature, and more certain in its ultimate results.—In this matter, the skill and judgment both of Professor Hassler and of Mr. Ingham, the then Secretary of the Treasury, have been eminently apparent. A like discrimination, though at first not so palpable, is manifest in the choice made of brass for the compound in which the standards were to be executed. The ordidary measures in use for purposes of commerce would most appropriately be made of this material, as less liable to oxidization, and it was held important that the prime standards kept only to authenticate those in common use should be of the same metal. To avoid, however, the uncertainty of expansion in a compound metal, the brass used for the standards has all been cast by the same process from pure zinc and copper, the produce of mines of our own country; it is therefore tough, hard, and of uniform density.

I have been induced to take this notice of these public works, finding, from conversation, that but *little* was known about them, and of course *less* interest taken in their proper execution than they deserve. This has not been the case in Europe, where the details of their construction have received more notice than have been conferred on any other scientific works instituted in this country. The latest documents concerning them are contained in a special letter from the Treasury Department of the 8th December.

METRIQUE.

* Document 299, of the year 1832.

From the Journal of the Franklin Institute.

A BILL FOR THE REGULATION OF THE BOILERS AND ENGINES OF VESSELS PROPELLED IN THE WHOLE OR IN PART BY STEAM.*

TABLE OF CONTENTS.

§ 1. Requires an enrolment, and license of navigation.

§ 2. Provides a penalty for navigating without a license.

§ 3. Requires the appointment of an inspector of boilers and machinery, and defines his duties, &c.

§ 4. Requires a certificate to the inspector from the owner or master of a steamboat, of the pressure of the steam intended to be used.

§ 5. Makes provisions intended to secure the safety of boilers.

ART. 1. Requires two safety-valves.
2. Provides for the graduation of the first.
3. Fixes the maximum pressure to be allowed upon it.
4. Provides for the regulation of the second.
5. Requires the second to be inclosed so as not to be accessible except by the captain of the boat.
6. Puts the second under the control of the captain of the boat.
7. Regulates the least rise to be given to the lock-up valve.
8. Directs the form of the lever of the valve.
9 Provides for each two small cylinder boilers, one set of safety. valves.
10. Requires a mercurial-gauge for low pressure boilers, and prescribes its arrangement.
11. Provides that it shall be open to examination by passengers.
12. Requires a fusible metal apparatus to be attached to every boiler.
13. Directs the fusible metal to be inclosed.
14. Provides for its not being tampered with.
15. Inspector to compound the fusible metal.
16. Prescribes the composition of the fusible metal.

§ 6. Requires an examination into the fulfilment of the foregoing provisions, by the inspector, previous to giving certificates.

§ 7. Penalties for interfering in any way with any part of the apparatus provided for the safety of the boiler.

§ 8. Prohibits more than two contiguous boilers to be connected by a water-pipe.

§ 9. Penalties for the bursting of a boiler caused by a deposite.

§ 10. Prohibits boilers in which the metal is exposed to heat without being in contact with water.

§ 11. A thorough examination of the boilers, &c., required of the inspeector. Proofs directed and proof-pressure prescribed. Certificates to be given by the inspector to be posted up under the penalties prescribed. Fees of inspector.

§ 12. Proofs, &c., to be made every six moths. Circumstances under which a license may be forfeited.

§ 13. Requires the pumps for supplying the boilers with water to be kept at work, when a boat is stopped for a temporary purpose. Penalty prescribed.

§ 14. Qualifications for the office of inspector laid dowh.

§ 15. Penalties for explosions when the master or engineer is engaged in gambling, or is intoxicated. Also from racing, &c.

§ 16. A neglect to obtain or renew certificates as prescribed, to bar from the recovery of a claim for freight or insurance. Owners of boats to be in such cases responsible for loss, or damage by explosions.

§ 17. Penalties in case of explosion when the captain, &c. has neglected to have the required inspections made, and certificates issued.

§ 18. Provides a bounty for boats with

* The sections of this bill which are taken from that reported by the Committee on Naval Affairs, in the Senate of the United States, at the session of 1835-6, are marked by a note of reference to the sections of the latter.

boilers on the guards, and suitable bulwarks between them and the interior of the boat.

§ 19. Inspector to be dismissed in case of making false certificates, &c.

§ 20. Provides for the recovery of fines. &c. Proviso, that suits must be instituted within two years after the offence has occurred.

§ 1.*—*Be it enacted by the Senate and the House of Representatives of the United States of America, in Congress assembled,* ——; to make a new enrolment of the same under the existing laws of the United States, and to take out from the collector or surveyor of the port, as the case may be, where such steamboat or vessel is enrolled, a new license, under such conditions as are now imposed by law, and as shall be imposed by this act.

§ 2.†—*And be it further enated,* That it shall not be lawful for the owner, master, or captain, of any steamboat, or vessel propelled in the whole, or in part, by steam, to transport any goods, wares, and merchandize, or passengers, in, or upon the bays, That it shall be the duty of all owners of steamboats, or vessels propelled in the whole, or in part by steam, on or before the —— day of ——, one thousand eight hundred and lakes, rivers, or other navigable waters of the United States, from and after the said —— day of ——, one thousand eight hundred and ——, without having first obtained from the proper officer, a license under the existing laws, and without having complied with the conditions imposed by this act; and for each and every violation of this section, the owner or owners of said steamboat, or vessel, shall forfeit and pay to the United States the sum of ——.

§ 3.‡—*And be it further enacted,* That it shall be the duty of the President to appoint at such ports on the navigable waters, bays, lakes, and rivers, of the United States, as in his judgment will be most convenient to the owners and masters of steamboats, and vessels propelled in the whole or in part by steam, one or more persons who shall be practical mechanics, of competent skill, to make inspections of the boilers and machinery employed in such boats and vessels, whose duty it shall be to make such inspections, when called upon for that purpose, to give to the owner or master of such boat or vessel, duplicate certificates of all such inspections, and the said person, so appointed, shall, before entering upon the duties of said appointment, take an oath, before some competent authority, faithfully to discharge and perform the same.

§ 4.—*And be it further enacted,* That the owner, master, or captain of each and every boat or vessel propelled in the whole or in part by steam, shall certify, to said inspector, the greatest pressure, or total elastic force, of the steam intended to be produced in the boiler, which certificate shall regulate in the proofs, trials, and construction, hereinafter required.

§ 5.—*And be it further enacted,* That each and every boiler of a steamboat, or vessel propelled in the whole or in part by steam, shall be constructed, and arranged, so as to comply with the following provisions:

1. There shall be two safety-valves, each of which shall be competent to discharge the steam made in the ordinary working of the boiler.

2. The first of said valves shall be graduated by the maker of the engine, and have stamped upon the lever, by which it is weighted, the pressure at which it will by calculation open, when the appropriate movable weight is placed at the several marks. Said pressure to be the difference between the pressure of the steam within, and atmospheric pressure on said valve.

3. When the movable weight exerts its greatest pressure, the total pressure upon said valve shall not exceed the pressure as certified according to the provision of the fourth section of this act.

4. The second of said valves, denominated the lock-up valve, shall be immovably weighted, the total pressure upon it not to exceed said certified pressure.

5. Said lock-up valve, with its lever and other attachments, shall be inclosed in a grated box, or otherwise duly arranged so that it can be raised, but not pressed down, except as above provided, upon its seat.

6. Said inclosure, or arrangements, shall be secured with a lock, of which the captain or master of said boat shall alone have the key.

7. Said inclosure or arrangements, shall admit a rise in the valve of at least one-fourth of the diameter of its seat.

8. The lever of said valve shall be so constructed as on the rising of the valve, to diminish the effect of the acting weight, by at least one-tenth of the ordinary pressure derived from said weight.

9. When two boilers, each of not more than forty inches diameter, are connected by a steam-pipe, each pair of said boilers may be furnished with safety-valves, as described in this section, for a single boiler.

10. When the certified pressure provided in section fourth, does not exceed two atmospheres, each and every boiler shall be furnished with a mercurial-gauge, indicating by a float or rod, upon a duly graduated and marked scale, the excess of pressure within the boiler over atmospheric pressure in inches of mercury.

11. Said gauge and scale shall be so placed as to be readily examined by any and every passenger on board of said boat.

12. Each and every boiler shall be provided with a fusible metal apparatus of suitable form and dimensions, to be applied to the boiler itself, or to its flues, at the place which may be considered that of greatest heat, or most liable to exposure froma deficient supply of water.

13. Said fusible metal shall be contained in a tube to prevent its exposure to pressure, and shall on softening, communicate an alarm by some suitable device.

14. Said apparatus shall be duly secured from being rendered ineffective, in the manner of the lock-up safety-valve heretofore provided.

15. The fusible metal hereinbefore referred to, shall be compounded by the inspector, who shall place it in the apparatus as aforesaid, and shall satisfy himself that the whole is duly arranged as heretofore prescribed; for which service he shall receive, on certifying the same, a compensation of ——.

16. The said alloys shall be compounded according to the certified pressure of steam within the boiler, by the following table of parts, by weight, of the ingredients.

TABLE OF ALLOYS FOR USE IN CLOSED TUBES, AND WITH A METALTIC STEM.

3	2½	2	1½	Certified pressure in atmospheres.
8	8	8	8	Tin.
8	8.5	8.6	8.7.5	Lead.
4.6	3	2	5	Bismuth.
7	6	5	4	Certified pressure in atmospheres.
8	8	8	8	Tin.
8.0.5	8	8.12	8.3.4	Lead.
		2	5	Bismuth.
11	10	9	8	Certified pressure in atmospheres.
8	8	8	8	Tin.
11.4	10.6	9.8	8.0	Lead.
		13	12	Certified pressure in atmospheres.
		8	8	Tin.
		13.2	12.3	Lead.

§ 6.—*And be it further enacted,* That before delivering the certificate hereinafter to be provided for, the inspector, heretofore provided, shall examine the apparatus required by section fifth, and shall ascertain that all the provisions of that article are complied with.

§ 7.—*And be it further enacted,* That any person or persons whatsoever who shall wilfully overload or otherwise render inoperative said safety-valve or valves, or render ineffective said mercurial-gauge or gauges, by plugging up or stopping off, or in any other manner prrvening their action, or shall in any manner, impair, or interfere, with the usefulness of said fusible metal apparatus, shall for every offence be subject to the penalty of —— dollars, and to an imprisonment at the discretion of the court, not to exceed ——, and in case of accident to said steam-boiler, resulting from said offence, by which life is lost, shall be deemed to have been guilty of manslaughter, and punished according to law for said offence.

§ 8.—*And be it further enacted,* That not more than two boilers of a boat, or vessel, propelled in the whole or in part by steam, and those immediately contigious, shall have connected water pipes, nor shall the license heretofore provided for, be issued until the inspector has satisfied himself, and has certified, that the provision of this section is complied with.

§ 9.—*And be it further enacted,* That for each and every bursting of the boiler of a steamboat or vessel propelled in the whole, or in part, by steam, which shall occur from a deposite of sedimentary matter within a boiler, the master of said vessel, shall forfeit the sum of —— dollars; and that in case life shall be lost by the same, he shall be deemed to have been guilty of man-

* § 1. Of the bill reported in Senate U. S.
† § 2. Of bill, &c.
‡ From § 3 of the bill reported, &c.

slaughter, and shall be liable to prosecution acordingly.

§ 10.—*And be it further enacted*, That no boat or vessel propelled in the whole, or in part, by steam, shall be licensed until the inspector has certified on examination, that no part of the boiler of said boat is, ordinarily, directly exposed to flame, or to heated air from the draught, without the immediate contact of water.

§ 11.*—*And be it further enacted*, That it shall be the duty of the person who shall be called upon to inspect the boilers and machinery of any steamboat or vessel, in conformity to the provisions of this act, carefully, fully, and thoroughly, to inspect and examine the engine and machinery of said boat or vessel, and to state his opinion of their soundness: and he shall, moreover, provide himself with a suitable hydraulic pump, and, after examining into the state and condition of the boiler, or boilers, of said boat, or vessel, it shall be his duty to test the strength and soundness of said boiler, or boilers, by applying to the same a hydraulic pressure equal to three times the certified pressure which the boilers are to carry in steam; and if he shall be of opinion, after such examination and test, that the said machinery and boilers are sound and fit for use, he shall deliver to the owner or master of said vessel or boat, duplicate certificates to that effect, stating therein the age of said boilers, and the pressure of steam which may be carried by them, and which shall in no case exceed one-third part of the proof-pressure, one of which certificates it shall be the duty of said master or owner, to deliver to the collector or surveyor of the port, whenever he shall apply for license or for renewal of license: the other he shall, under a penalty of —— hundred dollars for every day that he shall neglect so to do while the boat is running, cause to be posted up and kept in some conspicuous part of the boat or vessel, for the information of the public; and for each and every inspection of the said machinery, and inspection and test of the said boiler or boilers, the said inspector shall be allowed and paid by the owner or master thereof, and before the delivery of said certificates, the sum of —— dollars.

§ 12.†—*And be it further enacted*, That it shall be the duty of the owners or masters of said boats or vessels, to cause the examination of the machinery, and the examination and test of the boilers, as provided in the sections of this act, to be made, at least, once in every six months; and to deliver to the collector or surveyor of the port where such boat or vessel, has been enrolled or licensed, the certificate of such inspection; and on failure thereof, he or they, shall forfeit the license granted to such boat or vessel, and be subject to the same penalty as though he had run the said boat or vessel, without having obtained such license.

§ 13.*—*And be it further enacted*, That whenever the master of any boat, or vessel, or the person, or persons, charged with the navigating said boat or vessel which is propelled in the whole or in part by steam, shall stop the motion, or headway, of said boat, or vessel; or the said boat or vessel, shall be stopped for the purpose of discharging, or taking in cargo, fuel, or passengers; he, or they, shall keep the engine of said boat, or vessel, in motion sufficient to work the pump, and give the necessary supply of water, under the penalty of —— dollars for each and every offence in neglecting or violating the requirements of this section.

§ 14.†—*And be it further enacted*, That no other than a practical mechanic who shall be of the age of twenty-one years, or upwards, shall have served two years in a steam engine factory, or general machine making establishment, and who shall have a thorough knowledge of the working of an engine, and shall produce satisfactory testimonials of steady habits shall be employed as an engineer on board of any boat or vessel propelled in whole or in part by steam, provided that for every violation of this section, the owners or master of said boat or vessel shall forfeit the sum of —— dollars.

§ 15.‡—*And be it further enacted*, That for every explosion which shall happen from any cause whilst the captain, master, or engineer shall be engaged in gambling, or attending to any game of chance, or hazard, or shall be intoxicated, or which shall happen from racing, or from carrying higher steam than the quantity authorized by the certificate, the owner of such steamboat, or vessel, shall be subject to the penalties provided for in the sixteenth section of this act; and the captain, master, or engineer shall be respectively subject to the penalties hereafter provided in the seventeenth section of this act.

§ 16.§—*And be it further enacted*, That any owner or master, of any steamboat, or vessel propelled in the whole or in part by steam, who shall fail to obtain, or neglect to renew, the certificates of examination hereinbefore provided for in the several sections of this act, shall be barred from the recovery of any claim for freight or insurance that may accrue when without said certificate, and should any loss or damage to property, or injury to persons, in such case occur in consequence of the breaking of any part of the machinery, or bursting of the boiler or boilers, the owner shall be responsible to the full amount of said loss, damage, or injury.

§ 17.‖—*And be it further enacted*, That the captain or master of any boat or vessel propelled in the whole or in part by steam, which may not have been examined, and obtained the certificates required by the several sections of this act, shall in the event of loss or damage to property, or injury to persons, occasioned by the breaking of any part of the machinery, or the bursting of the boiler, or boilers, be subject to a fine of not less than ——, nor more than —— dollars, and an imprisonment of not less than ——, nor more than ——; and that in event of loss of life being the result of such accident, then said captain, or master, shall be adjudged guilty of manslaughter.

§ 18.—*And be it further enacted*, That any boat or vessel propelled in the whole or in part by steam, which shall have its boilers upon the guards of the boat, and shall have between them, and the interior of the boat, or vessel, a sufficient bulwark of timber, or other suitable material, so that passengers shall be protected effectually from injury in the event of explosion, shall be, on a certificate to the foregoing effect from the inspector heretofore provided, exempted from the payment of fees for the taking out of the license of navigation, and shall have remitted one half of the fees for proving and for other purposes of precaution heretofore provided. The fees remitted in such case to be assumed and paid to the respective officers by the United States.

§ 19.*—*And be it further enacted*, That for any false certificate, or one given without the thorough examination contemplated by this act, the inspector herein provided shall be dismissed from office, and fined not less than —— dollars, nor more than —— dollars, and imprisoned not less than ——, nor more than ——; and shall be incapable of ever being re-appointed to said office.

§ 20.†—*And be it further enacted*, That all penalties, fines and forfeitures imposed by this act, may be sued for and recovered in any court of the United States of competent jurisdiction within the district, or circuit, where the same may have been incurred, in the name of the United States —one half for the use of the informer, and the other half to the use and benefit of the United States.

Provided, That all suits, actions, or indictments instituted, commenced, or found, under this act, shall be commenced or found, within two years after the offence has been committed, or the cause of action accrued.

---

* § 5 of the bill reported in the Senate of U. S. with slight verbal changes.

† From § 6 of the law reported in the Senate of U. S.; the period for making the inspections of the boilers, &c., is here proposed to be extended to six months.

* From § 7 of the bill reported in the Senate, &c.

† The Committee propose this section as a substitute for the 16th section of the bill reported in the Senate. That section requiring an examination of engineers by the inspectors.

‡ From § 13th of the bill reported, &c.

§ From § 11th of the bill, &c.

‖ From § 12th of the bill, &c.

* § 17th of bill reported, &c.

† § 18th of bill, &c, with the addition of the proviso at the close of the section.

From Ure's Philosophy of Manufactures.

GENERAL VIEW OF MANUFACTURING INDUSTRY.

(Continued.)

In an analysis of manufacturing industry, the general functions of machines, and the effects of their improvements, ought to be well considered. Machines are of three kinds:—

1. Machines concerned in the production of power.

2. Machines concerned in the transmission and regulation of power.

3. Machines concerned in the application of power, to modify the various forms of matter into objects of commerce.

I. Machines engaged in producing power operate by counteracting gravity, inertia, or cohesion. The steam engine, by the expansive agency of vapor, raises and depresses its ponderous piston, and thereby moves its massive beams and geering.—The hydraulic wheel produces similar effects by the natural flow or fall of water from a higher to a lower level; and the windmill by the currents of the atmosphere. Blasting of rocks, in mining, exhibits elastic power overcoming cohesion.

II. The machines engaged in transmitting and regulating power are, toothed wheels, fly wheels of various kinds, valve governors, shafts, and other geering of mills.

III. The machines engaged in applying power to modify the forms of matter appear, at first sight, to be so multifarious as to set systematic arrangement at defiance. An outline of their connexions and dependencies has been attempted in the next chapter.

The philosophy of manufactures is well displayed in the economy of power. The value of steam impelled labor may be inferred from the following statement of facts, communicated to me by an eminent engineer, educated in the school of Bolton and Watt:—A manufacturer in Manchester works a 60-horse Bolton and Watt's steam-engine, at a power of 120 horses during the day, and 60 horses during the night; thus extorting from it an impelling force three times greater than he contracted or paid for. One *steam* horse-power is equivalent of 33,000 pounds avoirdupois, raised one foot high per minute; but an *animal* horse-power is equivalent to only 22,000 pounds raised one foot high per minute, or, in other terms, to drag a canal boat 220 feet per minute, with a force of 100 pounds acting on a spring: therefore a steam horse-power is equivalent in working efficiency to one living horse, and one-half the labor of another. But a horse can work at its full efficiency only eight hours out of the twenty-four, whereas a steam-engine needs no period of repose; and therefore to make the animal power equal to the physical power, a relay of 1½ fresh horses must be found three times in the twenty-four hours, which amounts to 4½ horses daily. Hence a common 60-horse steam-engine does the work of 4½ times 60 horses, or of 270 horses. But the above 60-horse steam-engine does one-half more work in twenty-four hours, or that of 405 living horses!—The keep of a horse cannot be estimated at less than 1*s.* 2*d.* per day; and therefore that of 405 horses would be about 24*l.* daily, or 7500*l.* sterling in a year of 313 days. As 80 pounds of coals, or one bushel, will produce steam equivalent to the power of one horse in a steam-engine during eight hours' work, sixty bushels, worth about 30*s.* at Manchester, will maintain a 60-horse engine in fuel during eight effective hours, and 200 bushels, worth 100*s.*, the above hard-worked engine, during twenty-four hours. Hence the expense per annum is 1565*l.* sterling, being little more than one-fifth of that of living horses. As to prime cost and superintendence, the animal power would be greatly more expensive than the steam power. There are many engines made by Bolton and Watt, forty years ago, which have continued in constant work all that time with very slight repairs. What a multitude of valuable horses would have been worn out in doing the service of these machines! and what a vast quantity of grain would they have consumed! Had British industry not been aided by Watt's invention, it must have gone on with a retarding pace, in consequence of the increasing cost of motive power, and would long ere now, have experienced, in the price of horses, and scarcity of water-falls, an insurmountable barrier to further advancement, could horses, even at the low prices to which their rival, steam, has kept them, be employed to drive a cotton mill at the present day, they would devour all the profits of the manufacturer.

Steam-engines furnish the means not only of their support but of their multiplication. They create a vast demand for fuel; and, while they lend their powerful arms to drain the pits and to raise the coals, they call into employment multitudes of miners, engineers, ship-builders, and sailors, and cause the construction of the canals and railways: and, while they enable these rich fields of industry to be cultivated to the utmost, they leave thousands of fine arable fields free for the production of food to man, which must have been otherwise allotted to the food of horses. Steam-engines moreover, by the cheapness and steadiness of their action, fabricate cheap goods, and procure in their exchange a liberal supply of the necessaries and comforts of life, produced in foreign lands.

Improvements in machinery have a three-told bearing:—

1st. They make it possible to fabricate some articles which, but for them, could not be fabricated at all.

2d. They enable an operative to turn out a greater quantity of work than he could before—time, labor, and quality of work remaining constant.

3d. They effect a substitution of labor comparatively unskilled, for that which is more skilled.

The introduction of new machines into any manufacture, with the effect of superseding hand labor, is tempered by the system of patents, which maintains them for a certain time at a monopoly price, and thereby obstructs their rapid multiplication. Did we admit the principles on which the use of particular self-acting mechanisms is objected to by workmen, we should not be able, in any case, to define the limits of their application. Had parliament acted on such principles sixty years ago, none of our manufactures could have attained to their present state of profitable employment to either masters or men. The immediate causes of their vast augmentation may be ascribed, under the blessing of Providence, to the general spirit of industry and enterprize among a free and an enlightened people, left to the unrestrained exercise of their talents in the employment of a vast capital, pushing to the utmost the principle of the analysis of labor, summoning to their service all the resources of scientific research and mechanical ingenuity; and finally, availing themselves of all the benefits to be derived from visiting foreign countries, not only in order to form new and confirm old commercial connexions, but to obtain an intimate knowledge of the wants, the tastes, the habits, the discoveries and improvements, the productions, and fabrics of other civilized nations. Thus we bring home facts and suggestions; thus we perfect our old establishment, and add new branches to our domostic stock; opening, at the same time, new markets for the sale of our manufacturing and commercial industry, and qualifying ourselves for supplying them in the best and most economical manner. By these means alone, and, above all, by the effect of machinery in improving the quality, and cheapening the fabrication of our various articles of export, notwithstanding an immense load of taxes, and a higher price of grain, our commerce and manufactures have also increased in such a degree, as to surpass the most sanguine calculations of the ablest political economists who have speculated on the prospects of mankind. We should never cease to bear in mind, that we are surrounded by powerful nations, composed of a people equally industrious, and more sober than ourselves, who, released from the turmoil of war, are intent on cultivating the productive arts of peace, and of pushing their commerce and navigation; whose eagerness of competition is stimulated by the view of the rich prizes which we have already won.

The attempts continually made to carry our implements and machines into foreign countries, and to tempt our artisans to settle and superintend them there, evince the high value set by other nations on our mechanical substitutes for hand labor; and as they cannot be directly counteracted, they should be rendered, as far as possible, unavailing, by introducing such successive improvements at home as may always keep us foremost in the career of construction. It would be therefore no less disastrous to the operative, than to the capitalist, were any extraneous obstacles thrown in their way, since any good machine suppressed, or rejected, in this country, would infallibly be received with open arms by some of our neighbors, and most readily by our mechanical rivals in France, Belgium, Germany, and the United States.

Mill architecture is a science of recent origin, which even at this day is little understood, beyond the factory precincts. It had been ably begun by Mr. Watt, but, till it fell into the hands of Messrs. Fairbairn and Lillie, the eminent engineers of Manchester, it was too subject to the whims of the several individuals, often utterly ignorant of statics or dynamics, or the laws of equilibrium and impulse, who had capital to lay out in building a mill. Each had his own set of caprices and prejudices, which he sought to embody in his edifice, little aware how much the different orders of machines

depended for the productiveness and precision of their performance, on the right magnitudes, proportions, and adjustments of the mainshafting and wheel-geering.—These are, in fact, the grand nerves and arteries which transmit vitality and volition, so to speak, with due steadiness, delicacy, and speed, to the automatic organs. Hence, if they be ill-made or ill-distributed, nothing can go well, as happens to a man laboring under aneurismal and nervous affections.

About three years ago, the above named engineers dissolved a partnership celebrated over the world; since which time each has expanded his energies, and distinguished himself in a peculiar line of work. I shall have occasion hereafter to describe several of Mr. Lillie's excellent mechanical constructions. Mr. Fairbairn has entered largely into the line of factory architect, for which his three-fold great workshops are admirably adapted. The capitalist has merely to state the extent of his resources the nature of his manufacture, its intended site, and facilities of position in reference to water or coal, when he will be furnished with designs, estimates, and offers on the most economical terms, consistent with excellence, according to a plan, combining elegance of external aspect, with solidity, convenience, and refinement in the internal structure. As engineer he becomes responsible for the masonry, carpentry, and other work of the building, for the erection of a sufficient power, whether of a steam-engine, or water-wheel, to drive every machine it is to contain, and for the mounting of all the shafts and great wheels by which the power of the first mover is distributed. The frontispiece of this volume exhibits a perspective view of a magnificent factory, lately finished by Mr. Fairbairn, and now at work under its spirited proprietor, Mr. Orrell. It is beautifully situated in the environs of Stockport, on a branch of the Mersey, the great river feeder of the cotton trade of England. In beauty of architectural design, it will yield to no analogous edifice, and, may indeed, bear a comparison in respect of grandeur, elegance, and simplicity, with many aristocratic mansions. The length of the apartments in each floor of the body of the house is three hundred feet, the breadth fifty feet, and the height of each floor twelve feet. Each window consists of two casements, extending from its top to its sill, one of which, nearly as large as a common window, may be thrown entirely open for admitting fresh air, independent of the mechanical ventilation. I have been favored, through the liberality of the architect and proprietor of this pattern structure, with an analytical section and ground plan of it, by which I shall be enabled, in the treatise on the cotton trade, to place before my readers a view of the whole anatomy of the mill, in the following order.

1. Its two-fold heart, or twin steam-engines, one of which makes its maximum effort, while the other makes its minimum, to secure perfect equability of impulsion through all the ramifications of the shafts, and to prevent arterial throbbing or tremor, formerly so common, and so injurious to the work of delicate machines.

2. The great bevel wheel-geering, which transmits the power of the engine in rectangular directions, either transversely or vertically, and with any modification of speed.

3. The horizontal and upright shafts, with their several pulleys.

4. The distribution of the strape, or belts, that convey the power from these revolving shafts and pulleys.

5. The respective positions of the various productive organs in their respective floors, such as the preparation machines, throstles, mules, power-looms, dressing machines, warping mills, &c. &c.

The recent innovations in proportioning the sizes, regulating the connections, and adjusting the movements of the system of shaft-geering, form a fine feature in the philosophy of manufactures. Thus not only an improvement has been made in the regularity of impulsion, but a considerable increase of power from the same prime-mover has been obtained; amounting in some cases, of old mills remounted by Messrs. Fairbairn and Lillie, to fully twenty per cent. The durability of shafts so exquisitely turned and polished, is another great advantage. The spinning factory of Messrs. Ashworth, at Egerton, which has been at work for several years, exhibits an elegant pattern of the engineering just described: for it has some subordinate shafts, hardly thicker than the human wrist, which convey the power of ten horses, and revolve with great speed, without the slightest noise or vibration. The prime-mover of the whole is a gigantic water-wheel of sixty feet diameter, and one hundred horses' power. I have frequently been at a loss, in walking through several of the millwright factories, to know whether the polished shafts that drive the automatic lathes and planing machines, were at rest or in motion, so truly and silently did they revolve.

The method of increased velocities in the driving arms or shafts of factories, is undoubtedly, one of the most remarkable improvements in practical dynamics. It diminishes greatly the inertia of the mass to be moved, by giving to much lighter shafts and wheels the same momentum, and it permits the pulleys or drums, which immediately impel the machines by straps, to be reduced to a size much nearer to that of the steam pulleys fixed on the main axes of these machines. About thirty years ago the velocities of the main shafts, proceeding from the moving power, whether of steam or water amounted to no more than from thirty to forty evolutions per minute, and of the smaller and remoter shafts, to only forty or fifty. At the same period the drums were heavy tubs, and from thirty, to upwards of sixty inches in diameter. The improved system is under deep obligations for its actual state of perfection to the above-named engineers, though it had commenced, as we have stated, before their time. In the mills mounted by these gentlemen it is interesting to see slender shafts, like small sinewy arms, rapidly transmitting vast power through all the ramifications of a great factory.

The following details will place this matter in the clearest light:—A mill propelled by a steam-engine of fifty horses' power was formerly geered with shafts, having an average transverse section of thirty-six square inches, or varying in size from four to eight inches square. An engine of like power at the present day will, in consequence of the increased velocities above described, work with cylindrical shafts not exceeding five and a half, and often only three inches in diameter; possessing therefore an average area of only fifteen square inches, instead of thirty-six. The horizontal shafts that run under the ceilings of the different working rooms are two inches, and seldom exceed two and a quarter in diameter. Hence the mass of geering has been reduced fully one-half. But the shafts now make from one hundred and twenty, to one hundred and fifty revolutions in a minute, and, occasionally, as where trostlers are turned, so many as two hundred in the same time. Thus we see the requisite momentum is gained with a light shaft, while the friction is proportionally diminished, and the driving drum revolves with a velocity in accordance with the accelerated pace of the modern machines. The several speeds will be given in discussing their respective subjects.

The philosophy of manufactures investigates, in the next place, the most economical and energetic modes of applying the motive force to the various working organs; the carding-engines, the drawing-heads, the roving-frames, the throstles, the mules, the power-looms, the dressing-machines, &c.

The British capitalist is vigorously seconded by the British engineer, and need not, like the Continental adventurer, leave his funds long dormant, after an opportunity of placing them profitably in factory enterprise occurs. One mill-wright establishment in Manchester turns out from three hundred to four hundred yards of shaft-geering every week, finely finished, at a very moderate price, because almost every tool is now more or less automatic, and performs its work more cheaply and with greater precision than the hand could possibly do. Where many counterparts or similar pieces enter into spinning apparatus, they are all made so perfectly identical in form and size, by the self-acting tools, such as the planing and key-groove cutting machines, that any one of them will at once fit into the position of any of its fellows, in the general frame.

For these and other admirable automatic instruments, which have so greatly facilitated the construction and repair of factory machines, and which are to be found at present in all our considerable cotton mills, this country is under the greatest obligations to Messrs. Sharp, Roberts and Co. of Manchester. By such aids, fine-cotton spinners are enabled to mount their mules and the subservient frames within their own premises, with peculiarities of construction suited to their style of work; and many of them remodel more or less the apparatus made in the machine-shops. Thus the bobbin and fly-frames of Messrs. Cocker and Higgings, so justly admired, require occasionally to be modified in certain minutiæ, essential to fine work, before being used by certain manufacturers. It is this skill in machine mounting

or adjusting, combined with tact in spinning, which gives to our factories not merely their existing superiority over foreign rivalry, but the best security for its permanence. Indeed, the concentration of mechanical talent and activity in the district of Manchester and Leeds is indescribable by the pen, and must be studied confidentially behind the scenes, in order to be duly understood and appreciated.

The following anecdote will illustrate this position. A manufacturer at Stockport, whose name I shall suppress, being, not long ago, about to mount two hundred power-looms in his mill, fancied he might save a pound sterling in the price of each, by having them made by a neighbor machine-maker, instead of obtaining them from Messrs. Sharp and Roberts, in Manchester, the principal coustructors of power-looms. In order to give his fabricator every chance of success, the economist surreptitiously procured iron patterns cast from one of the looms of that company, which in its perfect state costs no more than £9. 15*s*. His two hundred looms were accordingly constructed at Stockport, supposed to be fac-similes of those regularly made in Manchester, and they were set to work. Hardly a day passed, however, without one part or another breaking down, insomuch that the crank or tappet-wheels had to be replaced three times, in almost every loom, in the course of twelve months. The fabric of the cloth was also indifferent. The proprietor perplexed beyond measure, inquired of a neighbor who worked similar power-looms, made by the Manchester mechanicians, whether *his* wheels likewise went to pieces every other day, and learned to his mortification, that not one of them had broken in the course of working, but that the four or five spare ones, originally sent from Manchester along with his two hundred and thirty-six power-looms, were unused and quite at his service. The old proverb of 'penny wise and pound foolish' never had a better illustration. His weaving factory had been most irregular and unproductive, while that of his neighbor had been uniformly prosperous. Being now heartily sick and ashamed of his fac-simile copies, he took measures in secret to have them replaced, as soon as possible, by Sharp and Roberts's substancial machines.

The astonishing expedition with which a great Cotton Factory, comprehending spinning and weaving, can be erected in Lancashire, arises from the vast collections of patterns of every variety, from those of gigantic steam-engines, water-wheels, iron-girders, and joists, down to the smallest member of a throstle or loom, in possession of the engineers, mill-wrights, and machine-makers. In the course of last year, Mr. Fairbairn equipped water-wheels equivalent to 700 horses' power, and steam-engines to 400 horses' power, from his engineer factory alone, independent of his mill-wright, and steam-boiler establishment. Hence, whenever capital comes forward to take advantage of an improved demand for goods, the means of fructifying it are provided with such rapidity, that it may realize its own amount in profit, ere an analogous factory could be set a-going in France, Belgium, or Germany.

The facilities resulting from the employment of self-acting tools have not only improved the accuracy, and accelerated the construction of the machinery of a mill, but have also lowered its cost and increased its mobility, in a remarkable degree. At present, a throstle frame made in the best manner may be had complete at the rate of 9*s*. 6*d*. per spindle; and a self-actor at about 8*s*. per spindle, including the patent licence for the latter The spindles in cotton factories move with so little friction that one horse power drives 500 on the fine hand-mule, 300 on the self-actor mule, and 180 on the throstle; which power includes all the subsidiary preparation machines, as carding, roving, &c. A power of three horses is adequate to drive 30 large looms with their dressing machine.

The fine bobbin and fly-roving frame, is now so greatly improved, that it can do a certain part of the work formerly done by the stretching mule; and performs as much for 9*s*. as the other did for 50*s*.

The dressing machine does at present 200 pieces of thirty yards each in a week,=6000 yards, and costs in wages to the dresers 50*s*. This branch of the trade having in consequence of the high wages been, like the mule spinning, continually disturbed by unions and strikes, has led to the invention of a self-acting machine which will dress at least 6000 yards of warp in two days, under the superintendence of a laborer at 3*s*. a-day; that is, at a cost in wages of 6*s*. This mechanism is at the same time greatly simpler and cheaper than the former, and will soon come into general use for coarse calicoes. It affords an instructive warning to workmen to beware of strikes, by proving how surely science, at the call of capital, will defeat every unjustifiable union which the laborers may form.

It is one of the most important truths resulting from the analysis of manufacturing industry, that unions are conspiracies of workmen against the interests of their own order, and never fail to end in the suicide of the body corporate which forms them; an event the more speedy, the more coercive or the better organized the union is. The very name of union makes capital restive, and puts ingenuity on the alert to defeat its objects. When the stream of labor is suffered to glide on quietly within its banks, all goes well; when forcibly dammed up, it becomes unprofitably stagnant for a time, and then brings on a disastrous inundation. Were it not for unions, the vicissitudes of employment, and the substitution of automatic for hand work, would seldom be so abrupt as to distress the operative.*

Some may imagine that the present work, which purposes to give a minute analysis and description of the several processes of manufacture, may prove injurious to the trade of this country, by putting foreigners in possession of much useful knowledge, now hardly within their reach. To this I reply, that knowledge is available just in proportion to the capacity and means of the persons who acquire it. Every invention and improvement relative to cotton fabrics is primarily attracted to Manchester as the surest and most productive scene of its development, where it can be most profitable to the inventor, because most profitable to the trade concentred there. Lancashire is the fertile and well-labored soil in which the seed of factory knowledge will bring forth fruit one hundred fold, whereas abroad it can yield little more than a tenfold return. However well informed the mill proprietors of Great Britain may be, and they unquestionably may bear a comparison in talent as in wealth with the landed aristocracy in any part of the world, still they may profit extremely by the methodical study of the elements of their prosperity. Many of the machines at present employed by them involve the most elegant applications of both physical and mechanical science; such indeed as if duly studied would enable them to understand the operative part of their business as clearly as the commercial, and thus protect them from those hazardous innovations which crafty projectors are perpetually pressing upon their adoption. Prodigious sums are wastefully expended every year by gentlemen manufacturers in this way, which would be saved by a more thorough acquaintance with those principles of science and art which I shall endeavor to expound.

Several individuals who have embarked vast fortunes in factories are to a very great extent the victims at least, if not the dupes, of scheming managers, who are ever ready to display their perverse ingenuity by the substitution of some intricate trap, for a simpler but less showy mechanism. I have known not a few cases, where a complete system of good machines, capable of doing excellent work, has been capriciously turned out of a cotton factory and replaced by another of greater expense, but of less productive powers, and less suited to the style of work, than the old one if skilfully managed. These substitutions are continual in many establishments. They interfere most essentially, and often unnecessarily, with the going of the mill, and are referrible almost always to injudicious choice at first, and capricious alterations afterwards,—circumstances over which the proprietor, from ignorance of the structure of a good machine, cannot always venture to exercise the proper control. There are no doubt many mill-managers perfectly fitted by judgment, knowledge, and integrity to second the sound commercial views of the mill-owner, and to advance the business with a profitable career. These practical men form the soul of our factory system. But with a wrong-headed, plausible manager, the proprietor is sure to be led such a mechanical dance as will bewilder him completely, unless he has acquired a clear insight into the *arcana* of the business by deliberate study of the composition and performance of each machine in his factory. It may be supposed that this species of education can be most easily acquired in the midst of the machinery itself. But this is a mistake which experience speedily proves.

There exists in most cotton-spinning

* The full discussion of this topic belongs to Book III.